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(*continued inside back cover*)

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AN EVALUATION OF SOCIOMETRIC-SOCIAL BEHAVIOR RESEARCH WITH PRESCHOOL CHILDREN

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Iowa Child Welfare Research Station

The usefulness of the sociometric score as a measure of social acceptance has been debated and investigated for about 25 years. One point of view found in current as well as early sociometric literature is expressed by Northway in her 1951 *Primer* (13):

> The usual measures of reliability and validity do not seem to be particularly appropriate for sociometry. Other tests such as those of intelligence and personality are based on the assumption that they are measuring a factor, capacity or trait within the individual. Sociometry, however, is concerned with discovering the preferred relationships which are present in a group at a particular time. If each individual discloses his preferences on a test honestly, the test is perfectly reliable and valid (p. 16).

Another point of view is evident in investigations of validity and reliability of the sociometric score. These studies have used other measures of social acceptance as indicative of usefulness, and retest relations to establish reliability.

The two other measures most frequently related to sociometric test choices of preschool age children have been: (1) observation records of social behavior in nursery school groups, and (2) teacher judgments of social acceptance in these groups. The nursery school group situation affords a more extensive opportunity to study the spontaneous social participation of children reared in families than can be found at present for any other age level. For older subjects, the most similar group situations used for social observation records have been school recess periods, school dances, camps, and office conversations (10). Evidence from these studies with older subjects suggests, but does not demonstrate conclusively, a direct positive relation between sociometric scores and real life social acceptance or interaction. However, sociometric scores have been shown to be related to an average of teachers' or observers' judgments of social acceptance for

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groups drawn from elementary schools, adult education programs, the armed forces, and industry (10). Variability has been large in the relations obtained between individual teacher's judgments and sociometric scores and no variables have been found to account for these individual differences. Because two or three teachers are used for each preschool group of 15 to 20 children, rather than the one teacher for a group of 25 to 40 subjects typically found with older age groups, the preschool group situation also affords excellent opportunities for study of the teacher judgment measure.

Sociometric – Play Interaction Studies

There are six published studies that attempt to establish sociometric choice as a predictor of observed social interaction or choice in nursery school or kindergarten free play. Three of the studies employ the rank difference coefficient as the measure of relationship and its standard error as the basis of estimates of significance. The standard error has been considered to be inadequate for such purpose since the publication of Olds' (14) and Thornton's (17) tables of significance for rank difference coefficients based on the exact sampling distribution of rho. The writer checked the coefficients of these three studies with Thornton's Table I. The results of these studies will be described on the basis of this check, rather than as reported in the studies.

An early investigation of sociometric-play interaction relations was a University of Iowa Study in Child Welfare by Hagman (7) published in 1933. She had 33 nursery school children fish for celluloid frogs, ducks, and fish on three different days and, after catching a toy, tell to whom they wished to give it. Play contacts of children were recorded by her modification of the Challman technique (3). The names of children playing together during a 15-second interval were recorded for an average of 40 observations per child. The children observed to rank as the five most frequent play contacts constituted 55 per cent of the verbal choices of 19 five-year-old children, and 30 per cent of the choices of 14 three-year-old children. The same children were named each day by 26 per cent and 28 per cent of these respective groups, and 32 per cent of these repeated choices were the most frequent play choices of the children who chose them. Hagman's oft-cited conclusion was: "The figures show that the questioning technique used was of little value as a method of determining the most frequent companions of the children in the group situation" (p. 46).

Koch (8), in a study published also in 1933, had children make verbal paired-comparison choices between all other 16 four-year-olds in their urban nursery school group. It took four months for these choices to be completed. Observation records were time sample check lists that furnished 37 behavior measures. She reported as significant many rank difference coefficients between verbal choices and social behavior variables, but only eight are significant (.05 level) by Thornton's Table I (17). The one positive rela-

tion of these eight was for "total acceptance of situation." The seven significant negative relations were for : "strike others," "push and pull others," "dawdle," "total escape reactions," "refuse children," "refuse adults," and the total of the last two categories.

Rosemary Lippitt (9) made an investigation similar to Koch's, using 45 Iowa Child Welfare Research Station preschool subjects. It took the children 6 to 12 hours scattered over many days to make paired comparison choices of the 14 other children in their group. Relations between these choices and 11 measures from eight check list 10-minute observation records per child were at the chance level (i.e., two of 33 rhos attained significance by this writer's check). When children were divided into upper, middle, and lower popularity groups and *t*'s computed for differences in means for the 11 measures, only eight of 216 *t*'s attained the .05 level of significance.

Florence B. Moreno (11) used as sociometric choices each child's verbal choice of a playmate for painting or drawing at a specified time in play. She made comparisons individually of these choices of 12 urban children and their play choices of companions in 35 hours of observation records. The presentation of both types of data was so complete that it was possible for this writer to compute a rank difference coefficient for Moreno's data, assigning ties for choice rank at random. The rho was .38 and non-significant.

Frankel's (5) subjects were 19 three- to five-year-old children attending the University of Toronto nursery school. Play contact choices were determined from six weeks of observation records by the Challman technique (3). The sociometric test occurred midway in the observation period. All rhos reported between sociometric and play contact choices are at the chance level by the present check. Additional analysis found that 32 per cent of the children chose 50 per cent to 100 per cent of their most frequent playmates, but only 11 per cent of the frequent play contacts were also verbal preferences, and 58 per cent of the children had no observed play contact with half their test choices.

Biehler (2) limited his study to percentage of agreement of sociometric and play contact choices of 25 Minnesota Institute of Child Welfare kindergarten children. Play contact choices were determined by two sets of 25 Challman technique observations (3) per child made within a two weeks period and separated from each other by a month. Sociometric test and retest first choices agreed with 72 per cent and 76 per cent respectively of the play contact first choices. He did not present quantitative data for second, third, and fourth choices, but stated there were no clearcut trends in these choices.

There is, then, no satisfactory evidence from obtained rhos that the sociometric score predicts social acceptance as observed in play for the preschool ages. Although one study reported sizeable percentage agreement between sociometric and play contact first choices, evidence of three studies

indicates percentage agreement for "most frequent" choices to be either negligible or between 30 per cent and 50 per cent.

Sociometric – Teacher Judgment Studies

The investigations by Koch (8) and Lippitt (9), already described, included also rho's obtained between sociometric scores and teacher judgments of social acceptance. Kock obtained a rho of .71 for one teacher, significant at the .01 level. Lippitt reported nonsignificant rho's between judgments of five teachers and sociometric scores for three groups of children. J. L. Moreno (12) reported in the mid-thirties percentage agreement of a teacher's judgment with sociometric choices of a kindergarten class. Since only seven teachers' judgments have been studied, data on relations between sociometric scores and teacher judgments of social acceptance at the preschool ages are not adequate for the drawing of conclusions.

Analysis of Reasons for Failure to Find Empirical Relations

Since studies with subjects of all ages have failed to find adequate evidence of relations between sociometric tests and observed social behavior, it is necessary to pose three conflicting hypotheses: (1) There is no basis for assuming the sociometric test to be a useful measure. (2) Sociometric tests are useful measures, although the usual measures of validity are not appropriate for sociometry (the viewpoint presented in the quotation from Northway (13) in the introductory paragraph). (3) While methods of investigation and statistical analysis used in these investigations have not established empirical relations between social behavior and sociometric choices, present knowledge is adequate to devise methods of measurement that will demonstrate the presence of such relations. Since hypotheses 1 and 2 need to be considered only if evidence indicates hypothesis 3 is not tenable, this section presents certain gross indications for the tenability of hypothesis 3.

Methods of Eliciting Sociometric Choice

Inadequate methods of eliciting sociometric choice may be responsible in part for the lack of evidence of usefulness at the preschool ages in particular. Two investigations have supplemented the usual verbal questions with photographs of children in the group. Polansky, Ronald Lippitt, and Redl (15, 16) had their 10- to 15-year-old emotionally disturbed subjects sort photographs of group members into choice boxes labelled with colors and words for degree of liking (or of excellence on near-sociometric questions). Although behavior prediction was not demonstrated for sociometric choice, many such empirical relations were reported for near-sociometric choices. Biehler's (2) kindergarten subjects completed line drawings with photograph faces of their preferred playmates, selected from photographs

of all children spread on a table. Biehler is the only investigator using preschool subjects to obtain clear evidence of relations with observed playmate choices for the sociometric test. It may be that supplementing verbal questions with photographs of children in a given group is required before preschool subjects can make sociometric choices which are related to social behavior interaction and choice.

Weighting of Choices in Scoring

The two most frequently used sociometric scores have been the sum of the number of choices as a friend (unweighted) and the sum of these choices weighted for order of choice. In their review of the experimental literature dealing with stability over time of sociometric test scores, Witryol and Thompson (18) point out that evidence and theoretical rationale are lacking to favor either type of score. Only two studies have been found that report evidence bearing on this issue. Frankel (5) reported a rho of .98 between weighted and unweighted choices of nursery school children. Clampitt (4) reported rhos of .99 for girls and .97 for boys between unweighted and weighted for choice sociometric scores of institutionalized mentally defective children.

The correlation of weighted and unweighted composite scores is not used to determine the combining of weighted or unweighted measures in prediction problems using other tests. Instead, according to Bechtoldt (1), the crucial point at issue in the weighting of parts is the effectiveness of prediction of the combined scores. The usefulness of weighted and unweighted measures can be interpreted most meaningfully by the empirical relations established between the composite score and the variable to be predicted. No report was found in the experimental literature of a comparison of the correlation of weighted and unweighted sociometric choices with independently measured variables.

Social Observation Records

The two most frequently used methods of recording social observation, the qualitative check list time-sample technique (6) and the Challman time sampling technique for social contacts (3), were developed in the early 1930's. Marked differences exist in the advantages, disadvantages, and type of resulting data of these two techniques. The check list time-sample technique observes each child individually and so requires a large total observation time to obtain adequate samples, but it has the advantage of recording qualitative aspects of social behavior. The Challman technique records only the names of children playing together (roughly defined) at a particular time; it has the advantage of requiring little observation time to collect adequate samples of this behavior. In the Koch (8) and Lippitt (9) studies, many qualitative check list categories were used in the time sampling technique; it is possible that samples of behavior in only a few categories could be large enough or differ sufficiently between subjects

to enter into significant relations with sociometric choice. On the other hand, the Challman technique may define play contacts too broadly to enter into relations with sociometric choice (i.e., coefficients may be lowered because aspects of play unrelated to friendship choices are included).

Statistical Indices Used

Statistical indices used in previous studies may be questioned also. Rank difference coefficients have been used for the correlation of sociometric choice and behavioral interaction or choice in all preschool subject studies and in most studies made at the older ages (10). None of the studies using rho described any consideration of the possibilities that the data might be continuous, normally distributed, or exhibit linear regression in relations, and hence that relations might be distorted and obscured by transformation to the rectangular distribution of the rank difference coefficient.

Percentage of agreement has been used to indicate agreement of sociometric and behavioral choice in most studies analyzing this aspect of choice. In no instance have statistical tests been made to see if obtained agreement in choices exceeds that possible by chance.

Summary and Conclusions

A review has been made of investigations concerned with the usefulness of sociometric test choices of preschool age children. There is no satisfactory evidence from obtained rhos that sociometric choices predict social acceptance and interaction of children in nursery school free play. Evidence is available concerning only seven teachers' judgments of this acceptance. An evaluation of methods of investigation and statistical analysis used in these studies suggests that use of methods presently known to be more adequate for measurement may make possible the demonstration of such usefulness for the sociometric test.

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A PICTURE SOCIOMETRIC TECHNIQUE FOR PRESCHOOL CHILDREN AND ITS RELATION TO TEACHER JUDGMENTS OF FRIENDSHIP

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The powerful influence of social groups on behavior and personality development is recognized both by lay and professional persons. Professional study of group behavior *as such,* as well as with reference to its influence on individual behavior and development, is a major research preoccupation of the sciences of cultural anthropology, psychology and sociology, and of such professions as psychiatry and social work. Sociometric studies of one type or another constitute a major strand in the fabric of ongoing research with groups. Sociometric tests have proved useful in the sense of predicting an average of teachers' or supervisors' judgments of social acceptance, although not individual teacher or observer judgments, in a wide variety of "societies," ranging from elementary school children to adults in schools, the armed forces and industry. But similar usefulness has not been demonstrated for sociometric techniques in preschool groups (7, 8). Actually, no justification for the use of the sociometric test as a measure of social acceptance or friendship has been demonstrated for preschool aged children. An analysis (10) of sociometric studies in the preschool age range (e.g. 1, 3, 4, 6, 7, 8, 11) reveals no satisfactory evidence that hypotheses of no relationship can be rejected for the observed social behavior variables employed in these investigations. Likewise, sociometric scores of preschool children have not been shown to be stable over periods of time ranging from one to nine months: i.e., intercorrelations have not been even as large in size as the *r*'s required for statistical significance of unrelated measures (2, 8, 13). Such conclusions have been reached by some of the authors of these studies, or have been arrived at by reanalysis of data originally reported positively (9, 10).

The present authors are convinced that friendships of a reasonably stable and discriminating sort exist at the preschool ages and believe that

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the developing of methods of studying such friendships in a precise and reliable fashion would constitute a worthwhile contribution to the social-behavioral sciences. This investigation sought empirical answers to two questions: (1) Is stability over time a characteristic of social acceptance measures of children in newly formed preschool groups? (2) Are children's sociometric choices related significantly to teacher judgments of friendship of these children? If so, is a first sociometric about as adequate as later measurements?

The evaluations by one of the authors (10) suggest that at least some of the previous failures to demonstrate sociometric usefulness (prediction of teacher judgments of acceptance) at the preschool ages may have been due to inadequate measurement of sociometric standing and/or to the use of statistical indices of relationship less efficient than some that might have been used. With such possibilities in mind, a picture sociometric technique was developed, teacher judgments of friendship elicited, and repeated measurements of both these types taken.

Subjects and Procedures

Subjects (*Ss*) were 48 children, 24 boys and 24 girls, attending three different preschool groups in the Laboratory Preschools of the University of Iowa's Child Welfare Research Station. Occupationally speaking, fathers of all but two of the *Ss* were professional or business-managerial. Sex and age distributions for the three groups are shown in Table 1. The group numbers I, II and III as used in this table will be applied to the groups throughout the present paper.

The three groups were selected from the Station groups available only after the selection of children and the assignment of teachers by the usual Station procedures. These procedures were carried out independently of both investigators. Selection of the groups for use in this study was made entirely on the basis of new group formations: i.e., the majority of the

Table 1

AGE AND SEX OF CHILDREN ATTENDING THREE PRESCHOOL GROUPS

	Group I *Summer Session* *1953*	*Group II* *Spring Semester* *1954*	*Group III* *Summer Session* *1954*
Number of Girls	9	10	9
Number of Boys	10	9	10
Mean Age at First Sociometric (in years and months)	4-2	4-2	4-11
Age Range at First Sociometric ..	3-9 to 4-9	3-4 to 5-2	4-1 to 5-7

children in each group had not previously attended a Station preschool. Since there is no *a priori* reason to question the assumption that the children in any group were a sample of the Station preschool population, the 48 *Ss* who did not overlap groups, and who had three test periods completed, are treated as a single sample for the indicated computations.

Overlap in group membership occurred for 8 *Ss*. Five children in II were also *Ss* in I, but had not attended preschool during an intervening fall semester. Two children in III were *Ss* in II. One boy served as an *S* in all three groups. The data for each of the *Ss* used in the $N = 48$ computations were from only that group for which the largest number of measures (including measures not described here) had been obtained for the given child.

The size of each group was 20 *Ss*, but in each group one child was absent too many days for data to be gathered, so the resultant *N*s are 19. All groups met in the afternoon four days per week and used the same building, playyard and equipment. Teachers for the three groups were generally equated in number and for experience. There was no overlap of teaching personnel among the groups.

In the picture sociometric technique, each child was asked to name or point to photographs of preferred playmates during an individual interview. Three choices of playmates were encouraged for each of three activities: outside play, inside play, and listening to stories. Additional choices were also recorded.

Each child was photographed achromatically at least twice, the resultant pictures measuring 3⅛ in. by 4⅝ in. The teaching associates (head teachers) of each group selected the picture most "representative" of the child. These photographs were placed in four rows of five pictures each on a 22 in. by 25 in. piece of white wallboard. This board was fastened to the wall of the experimental room at the estimated eye level of a seated child of the *Ss*' age. One-half of a group, randomly assigned, viewed one of two random photograph position orders at the first sociometric interview. Orders were alternated for subsequent interviews of all children.

The experimenters had been acquainted at least a week with each child before the first interview. All *Ss* voluntarily accompanied *E* to a sparsely equipped playroom in the preschool building for "choice sessions." *Ss* began the session seated in a chair directly in front of the picture board; most children stood several times during the interview to gain closer views of the photographs. *Ss* were asked to find their own picture. All *Ss* then, or after a few promptings, pointed to other children or named other children to whose pictures *E* then pointed. *E* controlled pointing and naming only to the extent of making sure that all pictures were pointed at and named before choices were requested. The wording of sociometric choice questions, "Who do you like to play with (outdoors)?," was the same in all interviews. Questions designed to elicit responses indicating that the child distinguished outdoor and indoor play situations preceded choices for these

situations. Choices were completed for each situation before choices were requested for the next situation.

Three sociometric interviews were completed for *Ss* in I and III, and four for *Ss* in II. The mean calendar day interval between sociometrics for all groups was 10.5 days, standard deviation 3.26 days. Initial interviews began when the photographs of all children were available, after 14, 22, and 9 school days for I, II and III respectively. All measures for I were made by a male graduate student,[2] with test sessions ranging from five to 15 minutes in length. The second author did assessments for II and III, with test sessions ranging from three to seven minutes.

A child's sociometric score was the sum of the choices of the child as a playmate by all *Ss* for any and all of the interview situations. Preliminary analyses of data indicated that weighted scores predicted teacher judgments better than unweighted scores. Hence, before choice summation, all first choices were weighted five points; second choices, four points; third choices, three points; fourth choices, two points; and fifth or later choices, one point.

The population of teacher judges of friendships in the three groups consisted in each case of the teaching associate and two assistant teachers; and, additionally for I, two graduate student observers who knew the group well. One of these two observers completed only the first two of the three judgments. The three teaching associates each had several years of teaching experience. I and III had one assistant teacher with no previous teaching experience and one with a year or more of previous teaching experience. Each of the two assistant teachers for II had one semester of teaching experience.

These judges were asked to list the four best friends in order of closeness for each child in the group. Judgment forms differed only in *Ss*' names for the three groups. The judges were given the form on the day of the first sociometric interview of a child in any series, and returned the judgments before the day of the first interview of the next series. Judgments for children absent during the sociometric interval were delayed for appropriate time periods of school attendance.

The three groups of teachers did not differ significantly (analysis of variance) in the number of best friends listed per child; but they were not consistent in the degree of agreement (*W* and the average rho) on repeated judgments. Agreement coefficients beyond the chance level were obtained for all judgments for teachers for II, for the first two judgments only for I, and for the first judgment alone for III. These differences on ranking of children within and between teacher groups led to use of pooled teachers' judgments for this variable.

The teacher judgment score, then, that was used to compute relationships was the mean of all teachers' judgments for a given child at the specified time. Each child's score for a teacher judgment was the sum

[2] The authors appreciate the help of Mr. Gerald Weiss in the collection of these data.

of the weighted average choices of the child as being a friend of other children, weights being assigned and summed as described above.

Product-moment correlation indices are preferred over the rho correlations used in earlier investigations because of the efficiency gained by using all the data. There was no reason to doubt continuity of the data used in this investigation. Inspection of scatter plots indicated no reason to question homoscedasticity of variance or similarity of shapes of distributions. Hypotheses of linear regression could not be rejected at the .10 level for the F's obtained for regression of sociometric scores and teacher judgment scores on each other. The data can be described as satisfying assumptions for use of product-moment correlations.

Results

1. Is stability over time a characteristic of measures of social acceptance of children in newly formed preschool groups?

Sociometric intercorrelations for the three groups, separately and combined, are given in Table 2. Half the individual group coefficients are significant by the sampling distributions of r for unrelated measures. Hypotheses of no relationship could not be rejected for the other six intercorrelations by this "best guess" comparison, although an additional three closely approach significance at the .05 level. Five of the seven correlations for scores separated by 10-day intervals can be described as related beyond chance by this standard.

Table 2

INTERCORRELATION COEFFICIENTS FOR SOCIOMETRIC SCORES FROM INTERVIEWS AT TEN CALENDAR DAY INTERVALS FOR ALL THREE GROUPS †

Group	*Sociometric Series*	2	3	4
I	1	.67**	.74**	
	2		.76**	
II	1	.43	.22	.27
	2		.73**	.43
	3			.53*
III	1	.85**	.33	
	2		.41	
Combined ($N = 48$)	1	.66**	.45**	
	2		.71**	

* Significant at $< .05$ level.
** Significant at $< .01$ level.
† Sampling distributions for correlation coefficients between repeated observations have not been developed. The significance levels used are those for correlations between independently obtained measures and may not be what would be obtained for intercorrelation coefficients.

Sociometric scores can be obtained for preschool children only by using small groups and this size limitation restricts inference from the group coefficients. Intercorrelations for the 48 non-overlapping Ss were as follows: test 1 vs. test 2, .66; 1 vs. 3, .45; and 2 vs. 3, .71. Each of these exceeds the r required for the .01 or less level of significance of independent measures. These data furnish evidence of a relationship between sociometric choices separated by 10- and 20-day intervals (i.e., of moderate stability over time). Significant differences in the 10-day interval related r's were not obtained by t test, but 10-day interval correlations were larger than the 20-day interval correlations in either direction (p of obtained t's, $< .05$ level in predicting third sociometric; p, $< .01$ level in predicting the first).

TABLE 3

INTERCORRELATION COEFFICIENTS FOR TEACHERS' JUDGMENT SCORES AT TEN CALENDAR DAY INTERVALS FOR ALL THREE GROUPS †

Group	*Teachers' Judgment Series*	*2*	*3*	*4*
I	1	.94**	.90**	
	2		.93**	
II	1	.55*	.19	.34
	2		.71**	.62**
	3			.80**
III	1	.62**	.67**	
	2		.76**	
Combined ($N = 48$)	1	.63**	.50**	
	2		.72**	

* Significant at $< .05$ level.
** Significant at $< .01$ level.
† Sampling distributions for correlation coefficients between repeated observations have not been developed. The significance levels used are those for correlations between independently obtained measures and may not be what would be obtained for intercorrelation coefficients.

Interpretation of the stability of sociometric scores depends somewhat on the stability of the other measure of social acceptance, teacher judgment scores. Table 3 summarizes intercorrelations for teacher judgment scores in the three groups, and for the combined group. Ten of the 12 coefficients are larger than the r required for significance of unrelated measures (nine of these at less than the .01 level of significance). All three of the teacher judgment series coefficients for the 48 Ss (1 vs. 2, .62; 1 vs. 3, .50; and 2 vs. 3, .72) are significant at less than the .01 level. Here again differences in relations at 10-day intervals were not significant. The 10-day interval correlation was larger than the 20-day for the third (t, 2.481; p, $< .05$) but not the first teacher judgment (t, 1.506, nonsignificant). However,

intercorrelations of both variables of this investigation suggest moderate stability over time for social acceptance of preschool children in newly formed preschool groups.

2. Are children's sociometric choices related significantly to teacher judgments of friendship of these children?

Table 4 presents correlation coefficients between sociometric and teacher judgment scores for all groups and test periods, and for the groups combined. Five of the 10 group coefficients are significant, four at less than the .01 level, and an additional two closely approach .05 level significance. The three groups differed in the number of test periods in which hypotheses of no relationship could be rejected. Relations beyond chance were found

TABLE 4

CORRELATION COEFFICIENTS BETWEEN SOCIOMETRIC SCORES AND AVERAGE TEACHERS' JUDGMENT SCORES IN THE RETEST SERIES FOR EACH PRESCHOOL GROUP, AND FOR ALL GROUPS COMBINED

	RETEST SERIES			
Preschool Group	*1*	*2*	*3*	*4*
I: Summer, 1953	.28	.42	.24	..
II: Spring, 1954	.16	.71**	.45	.68**
III: Summer, 1954	.47*	.68**	.66**	..
Groups Combined ($N = 48$)	.19	.63**	.40**	..

* Significant at $<$ .05 level.
** Significant at $<$ .01 level.

in all test periods for III, in half the test periods for II, and in none for I. For the combined group, the second and third test period coefficients were significant at less than the .01 level.

The inconsistent finding of relations in the three groups has a possible explanation other than the small number of children in each group. Individual teachers have been reported (5) to vary markedly in ability to predict elementary school children's choices of friends. To test this difference in teachers' judgments for preschool children, the authors sought a statistical test of agreement between teacher and child choices of three best friends (unordered). A chi square test of agreement is possible if it can be assumed that a teacher's judgments for one child were not influenced by judgments for another child, or were independent (an assumption not susceptible to proof or disproof). Using this assumption, chi squares were computed from the probability of occurrence of the obtained agreement between each teacher and child. For each teacher these chi squares were summed for the group and the probability determined.

The obtained significance levels for these summed chi squares were consistent with the data for group correlations between sociometric and teacher judgment scores. Agreement for two teachers of III was below the .001 level of significance for all three judgment periods, but agreement was significant at the .02 level for the third teacher on the last period alone. All three teachers of II had chi squares below the .02 level on the last two judgments, and below the .05 level on either the first or second judgment. Agreement beyond chance probability for I was found only for one observer on the second judgment and for two teachers and both observers on the first judgment. These data indicate that agreement beyond the chance level in three best friend choices would be found on an hypothetical overall test of agreement. The number of teachers with significant agreements exceeds the number of those whose judgments can be accounted for by chance in all test periods.

Percentages of agreement in teacher-child choices ranged from seven to 56 per cent. Approximately 30 per cent agreement corresponded to a chi square significant at the .05 level, and about a 50 per cent agreement leads to a chi square significant at the .001 level.

In summary, although individual teachers varied markedly in ability to judge the child's best friends, relations beyond chance were obtained by two tests of agreement between children's sociometric choices and teacher judgments of friends of these children. Agreement in choice of three best friends was about as good on the first as on later measurements, but sociometric and teacher judgment scores correlated significantly on the later, but not the first, test periods.

Summary and Conclusions

A picture sociometric technique considered suitable for preschool aged children was devised, and three groups of 19 children each were tested three or four times at approximately 10-day intervals. Judgments of the "closest" friends of each child were obtained at corresponding times from the three teachers of each group, and from an additional two observers for one group.

It was possible from the results to reject hypotheses of no relationship between the two social acceptance variables: children's sociometric choices and pooled teacher judgment scores of children's choices. Both the children's sociometric scores and teacher judgment scores were shown to be stable over 10- to 30-day intervals in newly formed groups. The moderate reliability obtained over these intervals suggests that both scores change with time. In each case the second measure predicted the terminal one more precisely (at less than the .05 level) than did the first. It cannot be said whether this is due to increased stability with time, or to decreased time intervals between predictions. Later child sociometric vs. teacher judgment correlations are significant, whereas the first was not.

Individual teachers were found to vary markedly in ability to judge the child's sociometric choice of best friends. Also, teachers of the same children did not consistently agree beyond the level of chance in judgments of social acceptance.

It seems, in general, to the authors that they have demonstrated that a useful technique for measuring preschool children's friendships can be developed and shown to be useful.

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A STUDY IN PREDICTION OF SOCIAL BEHAVIOR OF PRESCHOOL CHILDREN

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Increase of knowledge and development of theory in the area of social behavior depend on the accuracy, reliability and usefulness of measures of social behavior. The sociometric test has been one of the most widely used and promising of the social behavior measures. Its usefulness (or validity) may be demonstrated by showing that its scores are related to observed group relationships.

As pointed out in an evaluation of sociometric – social behavior research by one of the authors (10), previous sociometric studies using preschool children as subjects have not demonstrated such usefulness for the sociometric technique (e.g., 1, 3, 4, 6, 7, 11). However, those who know preschool aged children intimately consider them not only capable of but likely to participate in fairly stable and discriminating friendships with other children. The preschool group situation affords a more extensive opportunity to study spontaneous social participation of children reared in families than can be found at present for any other age level. It is important to measure the amount and nature of this participation, not only for its own practical importance, but because adequate techniques of measurement may make possible investigations of factors influencing the development of social behavior and personality.

The authors of this paper have developed a picture sociometric technique (8) and have demonstrated moderate reliability for it in two or three retests at intervals of approximately 10 days for each of three groups. Sociometric scores obtained by this technique were shown to be useful in predicting another measure of social acceptance. They correlated significantly in a positive direction with teacher judgments of children's friendships in

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two of three groups studied, and it was possible to reject hypotheses of no relationship for all test periods when the subjects were treated as a single sample.

A desire to extend research on usefulness of this sociometric procedure led the authors to devise a technique for recording children's interactions in free play situations and for deriving friendship indices from these records. The two methods of recording observation of social participation used in earlier studies (2, 12) differ markedly from each other in the type of resulting data (10). Failure to demonstrate sociometric test prediction of these data may indicate that both methods are inadequate measures of children's social participation.

This investigation proposed to investigate three questions:

1. Is the degree of a child's participation in qualitative categories of spontaneous play related to the child's sociometric score and to teacher judgments of social acceptance?
2. Is observed social acceptance in preschool free play predicted by both sociometric scores and teacher judgment scores?
3. Do choices of the child's three best friends in the picture sociometric technique and in the judgment of teachers agree with those observed in play to an extent greater than chance?

Subjects and Procedures

Subjects (*Ss*) were all children but one in each of two groups of the Laboratory Preschools of the State University of Iowa's Child Welfare Research Station. One child in each group missed school too much to be included in the study. Group I (designated hereafter as I) was made up of 10 girls and 9 boys having a mean age of 4-2 years, and a range from 3-4 to 5-2 years at the first of the series of four sociometric tests. Group II (designated hereafter as II) was made up of 9 girls and 10 boys. At the time of the first of the series of three sociometric tests, their ages ranged from 4-1 to 5-7 years and the mean was 4-11 years. Occupations of the fathers of all the children were professional or business managerial. The children were either strange to each other or very slightly acquainted at the time the groups were started, with the exception of three children who were members of both groups. One of these three children was the boy in I who missed school too much to be an *S*. Teachers were equated in number and approximately matched for experience (one experienced head teacher and two graduate student assistant teachers in each group), and there was no teacher overlap between groups. The two groups of *Ss* were combined into a single sample of 36 *Ss* to provide a larger *N* for some computations; Group II records and tests were used in this sample for the three children belonging to both groups.

The methods of obtaining sociometric test scores and teachers' judgments of friendship status have been described elsewhere (8). The first

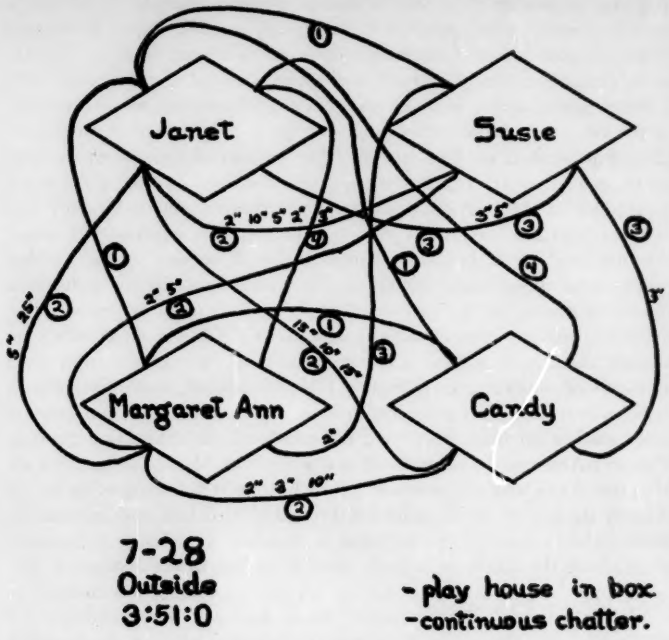

FIGURE 1—An observation record from Group II, B.

sociometric was started 22 school days after I's inception; and for II, nine school days after the group began.

The method developed by the present authors for recording social behavior in a free play situation was suggested by the Hyde and York technique (5) for studying the social interaction of adult psychotics. The technique made possible a record of four qualitative aspects of social interaction for an average of 3.5 children for each of 1114 two-minute observations.

A complete two-minute observation record is shown in Figure 1.[2] Names of the children to be observed are written in separate diamonds. The upper left side of each diamond represents *associative play* [children seem aware of a common activity or interest, and as further defined by Parten (12)]. Figure 1 shows an associative interaction between each of the *S*s with the exception of Margaret Ann and Susie. *Friendly approach* is represented by the lower left side of a diamond (defined as a verbal approach or

[2] An additional example and further description may be found in (9).

response to another child that is neutral, pleasant, friendly or helpful; it may be limited to one word or include many words). Figure 1 indicates that reciprocal friendly interactions occurred in all combinations of pairs of *Ss* except Susie and Candy. *Conversation* is scored if conversation of a friendly nature occurs between two children for one-half minute or more of the two-minute observation time. In Figure 1, conversation times were entered in seconds on the "friendly" line as conversation occurred. After 30 seconds of recorded conversation, lines were drawn between the upper right sides of the relevant diamonds, or between Janet and Candy and between Janet and Margaret Ann in this instance. The conversation category was not used for I, but was introduced for II because of the authors' judgment of its probable usefulness. The lower right side of a diamond represents *hostile* interaction (verbal or physical approach or response that interferes with the ongoing activity of another child, is a direct attack on another child, or is judged deliberate "snubbing" withdrawal from some approach of another child). Figure 1 shows mutual hostile interactions between Susie and Janet and between Susie and Candy; hostile conversation times marked on these lines were not tabulated. An interaction between Margaret Ann and Susie involved two seconds of hostile conversation on Margaret Ann's part and *attention* (overt but nonverbal recognition by the child of friendly or hostile behavior directed toward him and initiated by another child) from Susie. Attention is recorded, as on Susie's diamond, by attaching the hostile or friendly interaction line to the associative play side (upper left). Attention is not scored; this interaction was counted as hostile for both girls. "No response" to an approach from another child occurred in only 17 records. To record it, the upper point of the diamond is used to attach the interaction line, and the interaction is scored under the initiating category for both children. The encircled numbers in Figure 1 refer to categories of interactions between pairs of *Ss*: 1, associative; 2, friendly; 3, hostile; and 4, conversation. The subscripts are situational and temporal identifications, and the observation in Figure 1 came from the second of a series of such observations done with Group II.

The time when any child left or joined the children present at the beginning of the two-minute observation time was written beside the child's diamond. For children with one-half minute or more time in the group observed, interactions with all persons were scored; if the child spent less than one-half minute in the area of the group, the interactions were not scored for that child.

Two different scores from these observation records were possible for each child:

A *play interaction score* was obtained by adding the single observation scores in each category of social interaction and then dividing by the total number of minutes of observation for each child. The score for any category in a single observation was the number of children with whom that category of interaction occurred in the two minutes of observation. This score

distinguishes the degree to which each child engages in a given category of interaction in spontaneous play.

The *best friend score* is the sum of the weighted choices of the child as best friend in the combined categories of associative play and friendly approach. "Best friends" were limited to those three children with whom the child had the largest number of recorded interactions. This is an observation social acceptance score comparable to the sociometric score and the teacher judgment score, reported in detail in an earlier paper (8). Order of choice was weighted as was done for sociometric and teacher judgment scores, five points for first choice, four points for second choice, etc.

A minimum of 100 minutes of play observation was recorded for each child in each of three observation series: one series for I and two series (a minimum of 200 minutes for each child) for II. Most of the observations of I and of the second sociometric series (IIB) for II followed the fourth and third sociometric tests for these groups respectively. The first series (IIA) for II was recorded before and during the first and second sociometric tests. Observations were made during all preschool hours and activities except those in which spontaneous social interactions between children were not encouraged or could not develop, such as listening to stories, rest, juice or dressing. The children in all observations were in outdoor and indoor free play situations offering a wide choice of companions and activities.

Observer agreement between the authors for 25 joint observations was .92 by the Festinger formula:

$$\frac{\text{Sum agreements}}{\text{Sum agreements} + \tfrac{1}{2}\ \text{Sum omissions} + \text{Sum disagreements}}$$

and .90 by the formula:

$$\frac{2 \times \text{Sum agreements}}{2 \times \text{Sum agreements} + \text{Sum disagreements}}$$

Sampling reliability of the play interaction score was tested for odd-even split halves of IIA, for equal divisions of time for II, and for outdoor-indoor splits of the records of I. Odd-even Guttman coefficients were all over .90 except associative play (.87) and hostile interaction (.80); four of the 10 computed coefficients were above .95. In spite of differences significant at the .05 level in size of scores (analysis of variance), stability coefficients for IIA and IIB scores tended to be in the range from .87 to .92, and may be described as surprisingly high. In the split of the first 100 minutes of observation records, however, only moderate stability was found (.50 to .81) and differences between the first and second 50-minute scores were significant at the .001 level. Coefficients for the outdoor-indoor splits resembled in magnitude those obtained for the odd-even splits of records; category

coefficients ranged from .90 to .92, except associative play at .89 and hostile interaction at .78.

Sampling reliability of best friend scores was studied for only the outdoor-indoor and time splits of records. For I, the correlation coefficient of outdoor-indoor scores for the associative play plus friendly approach combination was .67, lower than the corresponding coefficient of .88 for play interaction scores. Correlation coefficients for best friend scores from the 100-minute and 50-minute time splits of records for II were .64 and .54 respectively, both exceeding the r required for independent measures to be significant at the .05 level for this N. The Guttman coefficient for the 100-minute split was .78.

By F tests, linear regression hypotheses could not be rejected at the .10 level for observation scores on sociometric and teacher judgment scores. Inspection of scattergrams gave no reason to question possibilities of any

TABLE 1

CORRELATION COEFFICIENTS BETWEEN SOCIOMETRIC SCORES AND OBSERVED PLAY INTERACTION SCORES FOR GROUPS I AND II

(sociometric period in Arabic numbers, observation period in Roman numerals)

	GROUP I	GROUP II		
Observation Category†	4, I	1, IIA	2, IIA	3, IIB
A	.47*	.59**	.58**	.64**
FA	.58**	.49*	.52*	.54*
C	..	.39	.49*	.74**
H	.44	—.17	.25	.01
A+FA	.54*	.56*	.58**	.63**
A+FA+H	.52*	.48*	.47*	.58*
A+FA−H	.70**	.62**	.66**	.66**
A−H	.44	.60**	.64**	.66**
FA−H	.60**	.60**	.66**	.64**
A+C	..	.52*	.56*	.69**
FA+C	..	.48*	.54*	.67**
A+FA+C	..	.53*	.57*	.67**
A+FA+C+H	..	.48*	.50*	.64**
A+FA+C−H	..	.57*	.63**	.67**
C−H	..	.39	.51*	.61**
FA+C−H	..	.54*	.62**	.70**
A+C−H	..	.55*	.61**	.67**

* Significant at $<.05$ level for 17 or 16 (II, 3, IIB) *d.f.*

** Significant at $<.01$ level for 17 or 16 (II, 3, IIB) *d.f.*

† Observation category letters signify the following: A = Associative Play; FA = Friendly Approach; C = Conversation; H = Hostile.

data not meeting other assumptions essential for use of product-moment correlation procedures.

Results

1. Is the degree of a child's participation in qualitative categories of spontaneous play related to the child's sociometric score and to teacher judgments of social acceptance?

Table 1 summarizes correlation coefficients between sociometric scores and play interaction scores for the two groups at the indicated times. Fifty-two of the 59 coefficients are significant at less than the .05 level, 29 of these at less than the .01 level. Two others are close to significance at the .05 level. When the 36 independent *S*s were treated as a single sample and correlations were computed between the last sociometric scores and observa-

Table 2

CORRELATION COEFFICIENTS BETWEEN POOLED TEACHERS' JUDGMENT SCORES AND OBSERVED PLAY INTERACTION SCORES FOR GROUPS I AND II

(teachers' judgment period in Arabic numbers, observation period in Roman numerals)

	Group I	Group II		
Observation Category†	4, I	1, IIA	2, IIA	3, IIB
A	.63**	.49*	.71**	.79**
FA	.74**	.70**	.65**	.83**
C	..	.40	.50*	.80**
H	.41	.02	.02	.25
A+FA	.71**	.65**	.58**	.85**
A+FA+H	.70**	.60**	.67**	.85**
A+FA−H	.75**	.66**	.74**	.82**
A−H	.55*	.42	.64**	.65**
FA−H	.74**	.74**	.70**	.80**
A+C	..	.47*	.64**	.81**
FA+C	..	.63**	.63**	.86**
A+FA+C	..	.60**	.68**	.86**
A+FA+C+H	..	.58**	.66**	.86**
A+FA+C−H	..	.61**	.70**	.81**
C−H	..	.30	.37	.50*
FA+C−H	..	.64**	.64**	.82**
A+C−H	..	.43	.60**	.72**

* Significant at $< .05$ level for 17 or 16 (II, 3, IIB) *d.f.*

** Significant at $< .01$ level for 17 or 16 (II, 3, IIB) *d.f.*

† Observation category letters signify the following: A = Associative Play; FA = Friendly Approach; C = Conversation; H = Hostile.

tion series play interaction scores, both the associative play and friendly approach coefficients were .54, significant below the .01 level. The coefficient for the additive combination of these two scores was .57. By *t* tests, these two single category scores differed from hostile scores in the degree of correlation obtained with sociometric scores, and, of course, did not differ from each other.

As can be noted, hostile social interaction scores were in no instance significantly related to sociometric acceptance, although one *r* approached .05 level of significance. Addition or subtraction of the hostile category did not influence consistently either the direction or size of coefficients for additive combinations of observation categories. For the last test period scores of the 36 *Ss*, the nonsignificant coefficient for hostile scores was .08.

Table 2 summarizes similar correlational data for average teacher judgment scores (of social acceptance) and play interaction scores. Here 45 of the 59 coefficients are significant at the .01 level, five are significant at the .05 level and four others closely approach .05 level significance. For the 36 *Ss* in the last test period, teacher judgment scores correlated .71 with associative play scores, .61 with friendly approach scores, and .79 with the additive combination of these scores, all coefficients being significant below the .01 level. While for each group and test period in Table 2 the hostile coefficients are nonsignificant, the 36 hostile scores for the last test period correlated positively, .38, and significantly (.05 level) with teacher judgment scores. For this sample, *t* tests indicated rejection of the null hypothesis for the differences between associative play and hostile scores in predicting teacher judgment scores, but not for the differences in prediction between the two friendly scores or between friendly approach and hostile scores.

Sociometric scores and teacher judgment scores did not relate in the same way to play interaction scores for the 36 *Ss*. The differences between these two scores were nonsignificant by *t* test in predicting associative play and friendly approach scores. However, the hypothesis of no difference between sociometric scores and teacher judgment scores could be rejected at the .01 level for prediction of a combination score, associative play plus friendly approach, and at the .05 level for prediction of hostile scores.

These data indicate that the degree of a child's participation in all categories of a friendly nature in spontaneous play is positively related to the child's sociometric score and to teacher judgments of social acceptance. Hostile play interactions do not appear to be related to children's sociometric scores, although they may be positively related to teacher judgment scores.

2. Is observed social acceptance in preschool free play predicted by both sociometric scores and teacher judgment scores?

The best friend score furnished the observation evidence of social acceptance comparable to the sociometric and teacher judgment scores. As shown in Table 3, significant relations were not obtained consistently between best friend scores and sociometric scores for the two groups nor

TABLE 3

CORRELATION COEFFICIENTS FOR OBSERVED BEST FRIEND SCORES WITH SOCIOMETRIC AND TEACHER JUDGMENT SCORES

Test Periods	*Teacher Judgment and BFS*	*Sociometric and BFS*
I: 4th test and observation	.62**	.58**
II: 1st test and IIA series	.43	.50*
2nd test and IIA series	.69**	.38
3rd test and IIB series	.62**	.34
36 *Ss*, last tests, observation	.64**	.47**

* Significant at $< .05$ level.
** Significant at $< .01$ level.

for the test periods of II; nevertheless, for the 36 *Ss*, the correlation was significant at the .01 level. Relations significant below the .01 level were obtained between best friend scores and teacher judgment scores, excepting the first test and observation period of II. The hypothesis of no difference between the teacher judgment and sociometric scores in the prediction of the best friend score could not be rejected by *t* test for the 36 *Ss*. In separate computations of best friend scores for the hostile category, similar to those of Table 3, the correlations in no instance approached significance.[3] Social acceptance in free play, then, may be said to be moderately predicted by both the sociometric score and the teacher judgment score.

3. Do choices of the child's three best friends in the picture sociometric technique and in the judgment of teachers agree with those observed in play to an extent greater than chance?

To determine whether agreement in choice of the child's three best friends in the three situations (sociometric test, free play, and teachers' judgments) was greater than chance, probabilities of the obtained agreement between any two situations were computed for each child. These probabilities were converted into chi squares, which were then summed for the preschool group to provide the chi squares used as tests of agreement.

By this test, the probability of the agreement obtained between the three best friends as observed in play and those chosen by the child on the sociometric test was below the .001 level for both groups and all test periods. Around 50 per cent agreement in choices consistently corresponded to these probabilities.

Teacher judgments of best friends also agreed beyond the level of chance with children's observed three best friends in all test periods by these chi

[3] Best friend scores computed for each single interaction category and their combinations are presented in detail in (9).

square tests. For each of the three teachers of I, chi square probabilities were below the .002 level. For the three teachers of II in three test periods, chi square probabilities were below the .003 level in six instances, and the .02 level in two others. Agreements were similar to those reported for sociometric and observed best friends, being around 50 per cent.

Summary and Conclusions

This investigation proposed to demonstrate that observed preschool group behavior is related to sociometric scores and to teacher judgments of social acceptance. A method for recording social interactions was devised and it provided reliable quantitative measurement of both social participation and social status. Interactions of each of 19 children of two preschool groups were recorded for a minimum of 100 minutes. The children were given three or four picture sociometric tests at 10-day intervals and teacher judgments of best friends of these children were obtained at times corresponding to the sociometric tests.

The following relations were found between these measures of social acceptance:

1. The degree of the child's participation in social interactions of a friendly nature in spontaneous play was positively related to the child's sociometric score and to teacher judgments of social acceptance. Hostile play interactions were not related to sociometric scores but had some positive relations with teacher judgment scores.

2. Social acceptance in spontaneous play situations was related to both sociometric and teacher judgment measures.

3. Choices of the child's three best friends in the picture sociometric technique and in the judgment of teachers agreed beyond chance with those observed in play.

The authors believe that these results demonstrate the possibility of measuring preschool-aged children's participation in discriminating friendships with other children.

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TYPES OF REACTIONS IN PUNISHMENT SITUATIONS IN THE MOTHER-CHILD RELATIONSHIP

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In an initial study concerned with the direction of aggression in the mother-child punishment situation, the present authors (1) described a newly designed cartoon-type projective device—the Punishment Situations Index (PSI)—developed to assess characteristics of punishment responses in the mother-child relationship. The results of this investigation, interpreted within Rosenzweig's framework of reactions to frustration (2, 3), indicated that the mother-child punishment situations are ones in which the major tendency was either to blame someone else (extrapunitiveness) or to blame oneself (intropunitiveness). It was also reported that the offense (e.g. lying, stealing, disobedience, destruction of parent's property) was infrequently a situation where punishment was evaded or the resulting frustration glossed over. When evasion of punishment did occur, it was most frequently related and described in the children's rather than the mothers' reports. In addition, the hypothesis was sustained that mothers seem more extrapunitive to children than they do to themselves. Mothers emerged as more extrapunitive and children more intropunitive according to both sources.

The present paper concerns itself with the types of reactions of mothers and their children in the punishment situation as they reported them.

SUBJECTS AND PROCEDURE

Each of the 10 pictures of the PSI (one series for boys, another for girls) was presented to 24 elementary school children, 14 girls and 10 boys, between the ages of 9 and 12, and their mothers. For each picture, an individual inquiry consisting of the following questions was conducted with the child and the mother and the answers were recorded verbatim by the interviewer:

1. Has this ever happened to you (with your child)?
2. What did your mother (child) *say* when it happened?
3. What did you *say* when it happened?
4. What did your mother (child) *do* when it happened?
5. What did you *do* when it happened?
6. How do you think your mother (child) *felt* about it?
7. How did *you feel* about it?

When the PSI is administered to both the child and the mother, four concepts of the punishment situation are obtained: from the child, his concept of himself (CC) and his mother (CM); from the mother, her concept of herself (MM) and her child (MC).

Scoring

The responses to the PSI were scored using the scoring factors developed by Rosenzweig (3). In this study we were particularly interested in the types of reactions in the punishment situation which, according to Rosenzweig, are: (a) obstacle-dominance (O-D), in which the barrier occasioning the frustration stands out in the response; (b) ego-defense (E-D), in which the ego of the subject predominates; and (c) need-persistence (N-P), in which the solution of the frustrating problem is emphasized. The scoring categories for obstacle-dominance (O-D) were *E'*, *I'* and *M'*. Examples of actual responses given by the subjects are shown below:

E' is scored when the frustrating obstacle is insistently pointed out:

(CC) I never get any money to buy candy.
(CM) You could have gotten killed.
(MC) No use cleanin' it up, it'd get messed up again.
(MM) Look, you have broken my vase.

I' is scored when the frustrating obstacle is construed as not frustrating, or in some way beneficial, or, subject emphasizes the extent of his embarrassment at being involved in instigating another's frustration.

(CC) I was glad I got it cleaned up.
(CM) She'd be embarrassed about her little boy's taking apples from the store.
(MM) I thought it was just kind of cute.
(MC) She knew better the next time.

M' is scored when the obstacle in the situation is minimized almost to the point of denying its presence.

(CC) I felt fine, glad she didn't whip me and all.
(CM) She'd just feel neutral.
(MM) No particular thought of it at all.
(MC) She'd just forget about it.

The scoring categories for ego-defense (E-D) were *E*, *I*, and *M*.

E is scored when blame or hostility is turned against some person or thing in the environment.

(CC) I felt she was being mean to me.
(CM) My mother didn't know what she was talking about.
(MM) Will she *ever* learn to behave?
(MC) You're a clumsy little girl.

I is scored when blame and censure are directed by the subject onto himself.

(CC) I needed to be punished.
(CM) She would blame herself.
(MM) I would feel that I hadn't raised her right.
(MC) She would be terribly sorry.

M is scored when blame for frustration (punishment) is evaded altogether, the situation being regarded as unavoidable; in particular, the "frustrating" ("punishing") individual is absolved.

(CC) I didn't blame her very much.
(CM) She'd realize I had no money.
(MM) If he was in the right, I wouldn't do anything to him.
(MC) That's just like a little girl.

The scoring categories for need persistence (N-P) were *e*, *i* and *m*.

e is scored when a solution for the situation is expected of someone else.

(CC) Mother, help me get down.
(CM) She would tell me to get some clothes on.
(MM) Your report card is very bad; you'll have to improve it.
(MC) She would expect me to help her with it.

i is scored when amends are offered by the subject, usually from a sense of guilt, to solve the problem.

(CC) I'd pay for it.
(CM) She would let me watch TV.
(MM) I would pay for the window.
(MC) She would get her books and start studying.

m is scored when expression is given to the hope that time or normally expected circumstances will bring about a solution of the problem; patience and conformity are characteristic.

(CC) I would take the punishment like a man.
(CM) She says I'll get over it.
(MM) They seemed satisfied and I was.
(MC) She would do it without fussing.

Results and Discussion

After scoring and tabulating the responses under the three categories, Fisher's matched-group *t* tests were computed between the six possible different combinations of *concepts* for O-D, E-D, and N-P. The results of the analyses, shown in Tables 1, 2, and 3, yielded the following conclusions:

TABLE 1

EGO-DEFENSE REACTION IN THE PUNISHMENT SITUATION IN THE MOTHER-CHILD RELATIONSHIP ($N = 24$)

	M_1	M_2	t	*Significance*
MC > MM*	12.77	9.98	2.94	.01
CM > MM	15.06	9.98	3.97	.01
CM > CC	15.06	10.73	2.93	.01
CM > MC	15.06	12.77	1.67	N.S.
CC > MM	10.73	9.98	.67	N.S.
MC > CC	12.77	10.73	1.69	N.S.

* MM = Mother's self-concept; MC = Mother's concept of the child; CC = Child's self-concept; CM = Child's concept of mother.

TABLE 2

OBSTACLE-DOMINANCE REACTION IN THE PUNISHMENT SITUATION IN THE MOTHER-CHILD RELATIONSHIP ($N = 24$)

	M_1	M_2	t	*Significance*
MM > CM	4.54	2.23	3.52	.01
CC > CM	5.00	2.23	3.45	.01
MC > CM	5.06	2.23	4.44	.01
MC > CC	5.06	5.00	.07	N.S.
CC > MM	5.00	4.54	.53	N.S.
MC > MM	5.06	4.54	.72	N.S.

TABLE 3

NEED-PERSISTENCE REACTION IN THE PUNISHMENT SITUATION IN THE MOTHER-CHILD RELATIONSHIP ($N = 24$)

	M_1	M_2	t	*Significance*
MM > MC	10.94	6.38	5.88	.01
MM > CM	10.94	6.85	4.14	.01
MM > CC	10.54	8.85	2.34	.05
CM > MC	6.85	6.38	.47	N.S.
CC > CM	8.85	6.85	1.83	N.S.
CC > MC	8.85	6.38	2.73	.02

1. *Ego Defense.* Table 1 indicates these significant relationships: (a) mothers report that children are more ego-defensive than mothers report themselves to be; (b) children report mothers to be more ego-defensive than mothers report themselves to be; and (c) children perceive their mothers as more ego-defensive than children report themselves to be. Since Rosenzweig asserts that ego-defense reactions occur only under special conditions of ego-threat, it appears from our results that with ego threat there is a tendency to overestimate the ego-defense mechanism in other persons but not in the self. In this connection, it is noteworthy that in the previous study (1) it was found that children also conceived of mothers as being more extrapunitive than mothers conceived themselves as being.

2. *Obstacle-Dominance.* From Table 2 it may be seen that: (a) mothers report themselves as being more obstacle-dominant than children perceive mothers to be; (b) children report themselves that they are more obstacle-dominant than children report mothers to be; and (c) mothers report children as having more obstacle dominance than children report mothers as having. It would seem that the presence of the frustrating obstacle is more important to children in punishment situations than to mothers. And, furthermore, children do not clearly recognize or are unaware that mothers are also frustrated by obstacles in the situation as much as mothers recognize it.

3. *Need-Persistence.* The following conclusions appear to emerge from the findings presented in Table 3: (a) mothers report themselves to be more need-persistent than they perceive their children to be; and (b) mothers report themselves to be more need-persistent than their children perceive them. Need-Persistence is considered by Rosenzweig (2) to occur invariably after frustration; that is, the "fate of the frustrated need is considered." Need-Persistence implies a *solution* to the frustration. It is interesting to note that children do not feel that solutions have been found for the punishment situation as much as mothers believe they have. Perhaps this may point up many mothers' over-all frustration in adequately dealing with disapproved behaviors.

Summary and Conclusions

In an effort to assess the types of reactions ocurring in the mother-child punishment situation, 24 children between the ages of 9 and 12 and their mothers were given the Punishment Situations Index. This index, a projective device recently developed to assess the direction of aggression in the punishment situations, consists of 10 cartoons (two series, one for boys and one for girls) depicting situations commonly leading to punishment of the child by his parent. On the basis of analysis made following Rosenzweig, the following conclusions appear warranted:

1. Where ego-threat is present, there is a tendency for both mothers and children to overestimate the ego-defense reaction in the other person, but not in the self.

2. Children appear to be more affected by obstacles in the punishment situations, but fail to recognize the extent of the importance of situational obstacles for their mothers.

3. Mothers regard themselves as seeking a solution to the situation more than children seem to realize they do, but they do not regard their children as seeking a solution as often as they do.

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DEVELOPMENT OF THE CONCEPT OF FLAG AND THE SENSE OF NATIONAL IDENTITY

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PROBLEM

This research had two purposes: The first was primarily descriptive, to trace the development of the concept of flag and the sense of national identity. The second purpose was to assess the applicability of principles of concept formation derived from other studies to a new content area. Of special relevance are the works of Piaget (3, 4, 5), who studied the development of such concepts as space, physical quantity, and moral judgment, and the study of the development of money concepts by Schuessler and Strauss (6). From these studies, two principles of concept formation may be derived: (1) The conjunction of terms and statements of relationship between terms which define the meaning (intension) of a concept is not grasped in its entirety or immediately by the child. (2) The order in which the elements of (intensional) meaning are grasped is fairly stable from child to child.[1] An attempt was made to determine the extent to which these conditions hold for the concept of flag and the sense of national identity.

PROCEDURE

Due to limitations on the scope of the study, direct observation of the developmental process within a longitudinal model was not possible. Instead, a cross-sectional design was used. The subjects were drawn from a Bloomington, Indiana, elementary school and ranged in age from 5 to 12 years (kindergarten through sixth grade). It was expected that this age distribution would produce a fairly broad range of responses, from those indicating only a rudimentary notion of the meaning of flag and country to those indicating a reasonably sophisticated concept. Eight students from each age level were randomly selected from the school population. Of these, two from each age level were used in pretesting the interview schedule leaving 48 in the final sample.

[1] However, due to factors such as maturation and intelligence, there may be considerable individual variation in the age at which a particular element of intensional meaning is mastered. It is the order, rather than age, that is being stressed here.

In constructing the interview schedule, a battery of open-ended questions was devised. The open-ended form was chosen in order to minimize the danger of imposing a frame of reference on the children's responses. The battery was administered to the pretest group and, after the usual attrition due to ambiguity or the inability to discriminate, 22 items remained for use in the final interview. The schedule appears below.

INTERVIEW SCHEDULE

1. Suppose someone came to you and said that they had never seen an American flag and asked you what it was like. What would you tell him? What colors is it made of?
2. How many stars and stripes does it have?
3. Where are each of the colors?
4. If you had a piece of cloth and it was just as little as a stamp and was (describe characteristics reported by interviewee), would that be an American flag? If the cloth was three blocks long and two blocks wide, would that be an American flag?
5. If you took a tablecloth and painted it with (characteristics reported), would that be an American flag? Would it be a flag if you left it on the table and used it as a tablecloth? Why?
6. Who made the first American flag? Why do you suppose they wanted to have a flag?
7. Do American ships carry the American flag? Why?
8. Does the flag fly over government buildings? Why?
9. Do only countries have flags? What else have flags?
10. How many different flags are there?
11. Do all countries have a flag? Which flag is best? Why?
12. Would a man that lived in France think the American flag was best? Why? Do all people think their country's flag is best?
13. If you went to another country to visit, could you fly the American flag there? If a government person went to this country on government business, could he fly the American flag there?
14. Does a country always have the same flag or does it change it sometimes? When and why?
15. Suppose the government decided to change the American flag and had it made green and white with a red apple in the middle. Would the new flag be an American flag? Suppose all the people wanted a new flag and it was green and white with a red apple in the middle. Would it be an American flag?
16. Suppose one part of the country got mad at the other part and they went to war. How many different American flags would there be? Why?
17. Do you pledge allegiance to the flag? Why?
18. If you had a flag and it got old and shabby, could you cut it up and use it for rags? Why?
19. Do they put the flag up especially on Washington and Lincoln's birthdays? Do they put it up on every president's birthday? Do they put it up because it's your birthday?
20. Why does the flag fly on a holiday? Do other countries put up their flag when they have a holiday?
21. Do you ever sing songs when they raise the flag? What song? Why?
22. Does the flag always fly at the top of the pole? Could it fly all day at the middle of the pole? Why?

The method of analysis of the responses was focused on the two principles of concept formation mentioned earlier. The first held that the acquisition of a concept is gradual. As the child grows older, he will have had time to come in contact with more of the terms and propositions which define a given concept. Moreover, he will have had time to develop the logical facility necessary to integrate this information into his frame of reference. Thus a high positive correlation is to be expected between age and performance on an interview designed to measure conceptual sophistication. However, such a correlation is only a starting point for the analysis of conceptual development. It may indicate what factors are related to the developmental process but not the ways in which those factors are operating.

TABLE 1

PATTERN OF RESPONSE WEIGHTS BY SCALE TYPE AND REPRODUCIBILITY COEFFICIENTS

*Item**	SCALE TYPE 1	2	3	4	5	6	7	8	9	10	*Scale Errors*	*Reproducibility Coefficient*
22	0	0	0	0	0	0	0	0	0	1	1	98
13	0	0	1	1	1	1	1	1	2	2	4	92
15	0	0	0	1	1	1	1	1	2	2	4	92
5	1	1	1	1	1	1	1	2	2	2	12	76
10	0	1	1	1	2	2	2	3	3	3	5	90
14	0	0	1	1	1	1	1	2	2	2	10	80
11	0	0	1	1	1	1	1	2	2	2	4	92
6	0	1	1	1	1	1	2	2	2	2	5	90
17	0	0	1	1	1	1	2	2	2	2	3	94
9	0	0	1	1	1	1	2	2	2	2	5	90
18	0	0	0	0	0	0	1	1	1	1	1	98
20	1	1	1	1	1	1	2	2	2	2	1	98
19	0	0	1	1	1	2	2	2	2	2	6	88
8	0	1	1	1	1	2	2	2	2	2	4	92
21	1	1	1	1	1	2	2	2	2	2	1	98
3	0	1	1	1	2	2	2	2	2	2	3	94
1	0	0	0	0	1	1	1	1	1	1	1	98
2	0	0	0	0	1	1	1	1	1	1	1	98
12	0	0	1	1	2	2	2	2	2	2	4	92
4	1	1	1	2	2	2	2	2	2	2	4	92
16	0	0	0	1	1	1	1	1	1	1	2	96
7	0	1	2	2	2	2	2	2	2	2	4	92
Frequency	4	8	5	3	4	3	8	7	3	3		
Scale Errors	3	21	11	2	12	7	19	7	3	0	85	
Reproducibility	95	88	90	97	87	90	90	96	95	100		93

* Items are grouped by difficulty, i.e., fewest cases above the highest cutting point.

The second principle held that the order in which the elements of intensional meaning are acquired is not random but fairly stable from child to child. The degree of conceptual facility implied in one level of response consistently serves as a prerequisite for all higher response levels. The order in which a particular element is acquired is a function of its complexity and the degree of abstraction, flexibility, and systematization on the part of the child it requires for comprehension. Schuessler and Strauss (6) point out the analogue between this principle and Guttman's scale analysis. In scale analysis, the coefficient of reproducibilty serves as a measure of the consistency with which one set of responses serves as a prerequisite for another. Hence it affords a means of assessing the applicability of these principles to the content area under investigation.

In order to facilitate scale analysis, the following method was used for ordering the responses to each item. Responses to the open-ended interview were recorded verbatim. They were then categorized and arbitrary weights assigned to each category on the basis of that category's position in a rank order of conceptual sophistication. The weights on all items were then summed for each individual. These sums were arrayed and a scalogram constructed.[2]

In addition, stages in the development of the concept of flag and the sense of national identity were delineated. This was done by isolating portions of the scalogram array where cutting points between item response categories tended to cluster within one or two ranks. These correspond roughly to scale types and are defined as stages or levels of development. The pattern of item response weights for scale types and reproducibility coefficients appear in Table 1.

Results

The first step in the analysis was to determine the relationship of age to interview performance. A zero order correlation of .76 was found between age in months and total scores on the interview. Allowing for variation in such factors as intelligence and rate of maturation, this value falls within the expected range.

The possible effect of sex on interview performance was investigated. No significant difference was observed between the sexes on over-all interview performance.[3] Moreover, the interview responses were scalable for a sample about equally divided between the sexes indicating similar developmental patterns. Although sex roles may involve many differences, obvious or otherwise, there may be certain response organizations where there is little sex difference in developmental patterns. The concept of flag and the sense of national identity seems to be a case in point.

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[2] Two approximations were required before the conventional requirements for scalability were met.

[3] Based on 14 pairs matched by age group, $t = .20$; $p > .05$.

By the method outlined, 10 scale types were delineated and equated with stages of development. It should be pointed out that these stages are not intended as final or immediately generalizable to any broad population. Rather, they are regarded here as a convenient device for pointing out important differences in the response organizations of children at various points along a developmental continuum.

Children at the first level of development (5–6 years) have little more than a name for a class of objects with common physical characteristics. A flag is a flag because "it's got the prettiest colors" or "it's got the little stars." The child at this stage does not know of other countries and denies the possibility of other flags. His vague impressions of the one flag of his experience are generalized to stand for all flags. Behavior toward the flag is wholly confined to using it to sing to or celebrate with (even on his birthday). He has little notion of how this comes about; there is simply a kind of configuration of flag-singing and flag-celebrating.

In the second developmental stage (5–6 years) the child first exhibits a notion of other country. Generally there are two kinds of countries, good and bad. "Other country has a different kind of flag. When we was fighting the bad country they had a different flag." There is some notion of using the flag for purposes of identification, but in quite a limited sense. Flags fly over special places but simply "because they belong there." In the main, flags exist to distinguish good from bad. "God made the flag so they'd know who was the good people." The child exhibits the beginnings of symbolism but the flag is not yet a genuine symbol. Goodness lies *in* the flag by virtue of the goodness of the agent who made it. Flag "belongs" rather than identifies. National identity is a matter of a simple dichotomy; either one belongs to the good country or one does not.

The orientation of children at the third level (7 years) differs markedly from that of children at the previous levels. It seems likely that these differences are due largely to new ways of looking at the same information rather than simply the acquisition of a number of new facts. The child shows significant development in his concept of country. Countries are now differentiated on the basis of geographical areas without the necessity of moral differentiation. They are possessors; they "possess" people, objects, even physical events. The purpose of the flag is to identify proprietorship. It flies "to show it's an American ship" or "It says it's an American government building." People "possessed" by a certain country naturally prefer their own flag. However, "The American flag is best."

Responses of children in the fourth stage (7 years) are generally similar to those in the third. Minor differences occur in knowledge of the characteristics of the American flags and flags in general. There are some major differences centering around the concept of government. Previously, the flag, people, and government "belong" to a country. In this stage, country is corporation with certain assets: people, flag, physical objects, events, and sanctions on people's behavior. The government serves as a board of

directors which administers the assets belonging to country. It has power to alter certain of them such as the flag under restricted conditions. Still the emphasis of the child is on possession by a country rather than identification with it.

The major improvement in the fifth stage (8 years) is in the notion of a multiplicity of flags. This improvement seems to come from two sources: the notion of levels of government and a better comprehension of the number of other countries. The concept of states, first expressed in the fourth stage, is now more formally verbalized. States, as geographical subdivisions, have governments with administrative functions and flags to identify them. Instead of 10 or 15 other countries, there are now 50 or 60. "I think there are 108. Sixty are the flags of all the different countries and there is one for each one of the states." The American flag is now best because "America is the best country." The United Nations is now involved for some of the children at this stage (probably reflecting school curriculum). "There is two best. There is a blue one that stands for the whole world and a red, white and blue one that is the American flag."

In the sixth stage (8 years) the child begins to grasp the full extent of the symbolism associated with the flag. One sings the national anthem because "It's a way of honoring your country's flag." The flag is put up only on Washington and Lincoln's birthdays because "They were the greatest presidents." Thus raising the flag does not simply stand for president but for the property of being first president or best president. Government is still "keeper of the country." However, the child is now able to verbalize the relationship between such artifacts as the flag and government buildings to the active process of administration. "To show that's where the government is and they make the laws and the country's business there."

The seventh developmental stage (9 years) is characterized by a marked increase in the complexity of the children's responses. The child at this stage has the better notion of country. Country is more than a geographical area with a common administration. It is also a group which has certain common purposes and allegiances. Country has an administrative body, government, which in addition to its internal functions conducts the relations of the group with other countries. The child's concept of flag embodies all of this. He understands more fully that the flag is a conventional symbol. Flags can stand for countries, with broad and general common goals, or for smaller groups such as schools or clubs which have more specific common purposes. National identity is not merely a matter of possession. It now involves an identification with a group and the goals of that group.

In the eighth stage (10 years) the child shows an increase in his ability to handle propositions of abstract loyalty. Children at this stage fully comprehend that flag stands for loyalty to a set of goals and the group holding those goals rather than simply loyalty to government. The American flag

is no longer best without qualification. "If I lived in a different country and liked the way things were I probably would think their flag is best." Nor do people inevitably prefer the flag of their own country (or the American flag as the only alternative). "No, there might be people in some countries who liked another country better than their own."

The ninth and tenth developmental stages (11–12 years) are differentiated only by increased knowledge of rituals associated with the flag. At this point in the developmental process the child's verbal organization with respect to flag and national identity is a logical system. The child clearly understands the full implication of convention and is able to incorporate this understanding in responses showing a sophisticated conception of the relationship of convention to flag, people, and government. "Well, I don't think the government could change the flag like that (green and white with a red apple in the middle) unless all of the people agreed to it. If they did, it would be a true American flag because it stood for the American people." He also displays a better understanding of governments as mediating bodies between peoples and the use of the flag to identify this function. "Government people like ambassadors and things who have to work all the time in a foreign country have the American flag outside the place they work to show he's a representative of the American government."

At this level, the child has acquired a number of propositions which he systematically relates by means of several principles of classification. The system is manifested in the child's response to problems which fall within the scope of the classificatory scheme. Its component parts are the child's understanding of country, people, government, and the relationships between them; his understanding of the flag as a symbol, including the notion of a multiplicity of flags and the flag as a means of identification; his understanding of the flag as a conventional symbol which stands for allegiances and purposes; and his understanding of the implications of flag, country, and people for his behavior including the conventional nature of those implications. This system may be thought of as a developed concept of flag and sense of national identity.

Discussion

These data suggest that conceptual development in the area of flag and national identity conforms to the pattern found in other content areas. The acquisition of the concept is gradual as inferred from the correlation between chronological age and interview performance. The elements which define the concept are related in propositions which increase in complexity as the children are older. Scalogram analysis indicated that the order in which the elements are acquired and the types of relationships perceived among them is fairly stable from child to child. This order can be explained as a function of the ability to perform the logical operations necessary

to relate a set of terms as well as the availability of information about those terms.

Analysis of the content at each stage of development suggests an interesting parallel between development of the sense of national identity and development of the self. Mead (2), for example, holds that development of the self is predicated upon the awareness of others and their expectations toward one's own behavior. Similarly, identification with one's own country is predicated upon an awareness of other countries and the identification of people within those countries. This awareness develops from a conception of a unilateral relationship (self and specific other) where country possesses person to an identification with the common goals and purposes of a group (generalized other).

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THE RELATION IN YOUNG CHILDREN BETWEEN CHARACTERISTICS OF THEIR PLAYMATES AND CERTAIN ATTRIBUTES OF THEIR SIBLINGS[1,2]

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PROBLEM AND PROCEDURES

The children with whom a youngster plays are doubtless factors in molding his personality and the children he prefers to associate with, as well as those that are available as playmates, are determined in part by his sibs. In addition, it seems likely the child's interest in and attitudes toward his peers are functions in part of the relations with his parents that develop out of the triangular interactions of parent, child, and sib. Since the psychological literature has not given the playmate problem much attention in considering the effects siblings have directly and indirectly upon each others' attitudes and interests, we have selected for study the question of the relation between certain characteristics of the associates or playmates of young children from two-child families and the relative age as well as sex of their sibs. Sex differences in playmate patterns were also given some attention. To be more specific, in addition to the sex of the child, the independent variables in the study are the child's ordinal position in his sibship, the age difference which separates him from his sib, and the sex of the latter. The dependent variables are the age and sex of the children

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played with or preferred as associates, the amount of play with the sib's friends, and the kind of treatment believed to have been received from the latter.

The subjects in the study were 360 five- and six-year-olds from two-child, intact, native-born, white, urban families. The investigation employed a $3 \times 2 \times 2 \times 2$ design. Hence, there were 24 matched subgroups. These represent three levels of sib-age difference (under two years, two to four years, and four to six years), two ordinal positions, and two sexes of subject, as

TABLE 1

MEANS AND STANDARD DEVIATIONS OF THE DISTRIBUTIONS OF THE AGES OF THE SUBJECTS AND OF THEIR SIBLINGS—TWENTY-FOUR BASIC GROUPS

DESCRIPTION OF GROUP				Subject		Sibling		Sibling Age Difference	
Subject Sex	Subject Ordinal Position	Sibling Sex		Subject Mean	Subject Sigma	Sibling Mean	Sibling Sigma	Sibling Age Difference Mean	Sibling Age Difference Sigma
			I. SIBLING AGE DIFFERENCE 7–24 MONTHS						
M	2	M	....	71	6.7	89	8.0	18	4.6
M	2	F	....	70	6.2	88	7.3	18	3.4
F	2	M	....	69	7.9	88	7.2	19	3.4
F	2	F	....	71	8.6	90	7.1	19	4.0
M	1	M	....	72	6.4	53	7.5	19	3.5
M	1	F	....	70	7.8	53	9.8	17	3.9
F	1	M	....	73	5.2	56	6.6	17	4.8
F	1	F	....	72	6.3	53	7.7	19	3.6
			II. SIBLING AGE DIFFERENCE 25–48 MONTHS						
M	2	M	....	70	6.2	104	9.2	34	6.6
M	2	F	....	71	6.1	111	8.6	40	6.0
F	2	M	....	71	6.5	106	10.2	35	6.8
F	2	F	....	74	5.0	110	7.2	36	5.7
M	1	M	....	72	6.5	37	8.8	35	6.6
M	1	F	....	73	5.6	35	9.0	38	7.5
F	1	M	....	71	7.3	35	11.2	36	6.6
F	1	F	....	71	6.2	36	6.0	35	7.1
			III. SIBLING AGE DIFFERENCE 49–72 MONTHS						
M	2	M	....	69	6.4	128	8.4	59	7.2
M	2	F	....	74	6.2	132	10.7	58	6.6
F	2	M	....	73	5.0	126	8.0	53	5.1
F	2	F	....	68	4.9	124	7.3	56	5.8
M	1	M	....	74	6.7	19	5.7	55	6.1
M	1	F	....	73	6.9	17	6.2	56	5.3
F	1	M	....	73	6.1	17	6.0	56	4.4
F	1	F	....	75	4.8	17	6.3	58	7.0

well as two sexes of sibling.[3,4] There were 15 subjects in each of the 24 basic groups. Each group was matched individual by individual with every other in age of child, socioeconomic level of the child's father's occupation (1), and neighborhood of residence of the family (10). Tables 1 to 4 describe the groups so that the reader may judge of the degree of success achieved in the matching. About 84 per cent of the age matchings were within six months; 85 per cent of the occupation matchings within one occupation-scale level (1); and 70 per cent of the neighborhood matchings within one rank on the neighborhood scale (10). Level 4 of the occupation scale, the farming group, was omitted because our subjects were all urban children.

TABLE 2

DISTRIBUTION OF THE SUBJECTS IN TWENTY-FOUR BASIC GROUPS IN TERMS OF FATHER'S OCCUPATION

DESCRIPTION OF GROUP			7–24 *Months between Siblings*						25–48 *Months between Siblings*						49–72 *Months between Siblings*					
Subject		Sibling	CLASS OF FATHER'S OCCUPATION																	
Ordinal																				
Sex	*Position*	*Sex*	*I*	*II*	*III*	*V*	*VI*	*VII*	*I*	*II*	*III*	*V*	*VI*	*VII*	*I*	*II*	*III*	*V*	*VI*	*VII*
M	2	M	7	1	2	5	.	.	5	2	2	6	.	.	3	2	3	6	.	1
M	2	F	1	3	5	5	1	.	4	3	2	4	2	.	2	4	3	4	1	1
F	2	M	4	2	4	5	.	.	4	3	2	4	2	.	2	4	5	4	.	.
F	2	F	3	2	5	4	1	.	2	3	5	5	.	.	3	3	4	3	2	.
M	1	M	4	3	3	3	2	.	4	2	3	6	.	.	4	4	4	2	1	.
M	1	F	6	.	4	4	1	.	4	3	2	5	1	.	3	2	4	2	3	1
F	1	M	2	2	6	5	.	.	5	3	1	4	2	.	1	2	6	4	1	1
F	1	F	2	4	3	6	.	.	4	2	5	4	.	.	3	4	4	3	.	1

The children were drawn chiefly from the public schools of Chicago, with only one private school system, the University of Chicago Laboratory Schools, contributing subjects. Usually only one sib from a pair was studied. References (4, 5, 6) give a discussion of some of the matching and sampling problems. We were torn over controlling, for instance, neighborhood of residence because of the suspicion that this tends to vary with the ordinal position of the child, the second child being more likely to be reared in a

[3] We shall often refer to the groups in code as follows: The first letter and number will indicate the sex of the child subject and his ordinal position in his sibship, the second letter the sex of the sibling, and the numbers in parentheses the age difference in months which separates the child from his sib. Thus, M2F(25-48) refers to the group of second-born boys who have one sister within two to four years older.

[4] The reader should have it called to his attention that (1) what we have labeled a sib-spacing variable includes, in the case of the first-borns, also a duration-of-contact variable, and (2) that the second-borns in this study were the youngest in their sibships and may not be taken as representative of second-borns who have younger sibs.

neighborhood where more child playmates are available than were available to the first child in his early years. If this is the case, the vector is quite apart from the very direct influence of the first child on the playmates available to the second. Furthermore, families change their attitudes toward the child's associates the more children they have. For instance, greater care may be taken in the case of the first child to select for him playmates of his own sex and to control carefully his contacts. There are numberless of these background effects that are doubtless correlated to some degree with one or another of the sib variables we are exploring. The reader should keep these in mind, and, in spite of the many variables on which

TABLE 3

DISTRIBUTION OF THE SUBJECTS IN TWENTY-FOUR BASIC GROUPS IN TERMS OF NEIGHBORHOOD OF RESIDENCE

DESCRIPTION OF GROUP			7–24 Months between Siblings					25–48 Months between Siblings					49–72 Months between Siblings				
Subject		Sibling	SOCIO-ECONOMIC CLASSIFICATION OF NEIGHBORHOOD OF RESIDENCE														
Sex	Ordinal Position	Sex	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
M	2	M	11	3	.	1	.	7	4	.	2	2	10	3	1	.	1
M	2	F	7	3	.	3	2	9	1	4	.	1	8	2	1	4	.
F	2	M	9	4	1	1	.	8	1	3	2	1	9	3	1	1	1
F	2	F	9	4	.	2	.	6	2	2	5	.	7	4	1	2	1
M	1	M	10	1	1	2	1	9	.	5	1	.	9	.	3	2	1
M	1	F	9	1	3	2	.	7	1	4	3	.	7	2	4	2	.
F	1	M	10	.	3	1	1	7	4	3	1	.	12	.	1	2	.
F	1	F	7	3	1	2	2	6	4	4	1	.	12	.	1	2	.

our groups are matched, not attribute to direct face-to-face influence of the sib all of the relations to be observed in our data. Also, to what extent our findings are applicable to age levels other than the one explored is a question.

The data being reported were obtained from an interview with the children. The subjects were interviewed individually while they played with toys which the interviewer provided. Most of the youngsters were reasonably communicative, though for the accuracy of some of their judgments —e.g., quantity judgments—we cannot vouch. What is being reported is what the children *said*. We are sure of no systematic errors in our data because of semantic considerations; however, it is possible that the first-born's idea of what was much or little association with his sib or the latter's friends was based on a different standard from that to which the second-born referred his judgments. Each child was asked in the interview each question in a standard series and although, in the main, a given order was followed, the questions were embedded in the general conversation as the

TABLE 4

NUMBER OF SUBJECTS IN EACH OF THE BASIC AND COMBINATION GROUPS

DESCRIPTION OF GROUP				AGE DIFFERENCE BETWEEN SUBJECT AND SIBLING IN MONTHS			
Subject		Sibling					
Sex	*Ordinal Position*	*Sex*		*7–24*	*25–48*	*49–72*	*Total*
M	2	M	.....	15	15	15	45
M	2	F	.....	15	15	15	45
F	2	M	.....	15	15	15	45
F	2	F	.....	15	15	15	45
M	1	M	.....	15	15	15	45
M	1	F	.....	15	15	15	45
F	1	M	.....	15	15	15	45
F	1	F	.....	15	15	15	45
M	2	M or F	.....	30	30	30	90
F	2	M or F	.....	30	30	30	90
M	1	M or F	.....	30	30	30	90
F	1	M or F	.....	30	30	30	90
M or F	2	M	.....	30	30	30	90
M or F	2	F	.....	30	30	30	90
M or F	1	M	.....	30	30	30	90
M or F	1	F	.....	30	30	30	90
M	1 or 2	M	.....	30	30	30	90
M	1 or 2	F	.....	30	30	30	90
F	1 or 2	M	.....	30	30	30	90
F	1 or 2	F	.....	30	30	30	90
M	1 or 2	M or F	.....	60	60	60	180
F	1 or 2	M or F	.....	60	60	60	180
M or F	1 or 2	M	.....	60	60	60	180
M or F	1 or 2	F	.....	60	60	60	180
M or F	2	M or F	.....	60	60	60	180
M or F	1	M or F	.....	60	60	60	180
M or F	1 or 2	M or F	.....	120	120	120	360

interviewer saw fit. Also slight variations in question form were permitted if the child appeared not to understand the standard question.

The questions concerned the age and sex of the children played with in out-of-school hours, the child's preference as to age and sex of playmate, the age and sex characteristics of the child named as best friend and as best-liked playmate, the amount the child believed he played with his sib's friends, and the kind of treatment he thought he received from the latter.

The formula used to test the significance of group differences was

$$\frac{p_1 - p_2}{\sqrt{\frac{2pq}{n}}}.$$

(*See* 9, p. 76.) The incidences of various responses among the replies from the children in the various groups are given in Tables 5–14. At the bottom of the tables we have listed only the group percentage differences which are significant at the 5 per cent point or better.[5]

Alleged Amount and Quality of the Association with the Sib's Friends

It was no surprise to learn, when the children were asked whether they played much (a lot), sometimes (every once in a while), or very little (practically never) with the sib's friends that, as the sib age disparity widened, the children affirmed with increasing frequency they played little (Table 5), and with decreasing frequency they played much, with the latter's friends. The drop in degree of association with the sib's friends (or increase in report of very infrequent association) seemed to be greater in the case of those with a sister than of those with a brother (Table 5).

Zero to 47 per cent of the children, depending on the group (mean per cent for all the groups equals 17), maintained they played much with the sib's friends; while 27 to 100 per cent (mean, 58 per cent) asserted that they played very seldom or practically never. Even when the children differed less than two years in age, they did not report much association with the sib's friends. At this sib-age-difference level about a fourth of the children thought of themselves as playing occasionally, and 45 per cent as associating rarely, with the sib's playmates. Whatever these quantities may mean, it is apparent the children did not believe they had much intercourse with their sib's friends. Possibly the sibs did not have many friends—a condition likely to occur if the sibs are very young. Possibly, frustrated wishes made the contacts the children had seem limited. Possibly, a semantic variable is operating. Possibly, even, the children could not tell what friend belonged to the sib and what to them. In any case, it does appear reasonably clear that the wider the spacing the more those in a pair of sibs tended to go their own ways or failed to share associates, if they had any (Table 5). This latter general relation is, of course, what we had anticipated and we see it, for instance, as lying back of such findings as the positive correlation between magnitude of spacing and leadership reported in another study (6).

There seem to be no simple ordinal-position or sex differences in the frequency of report of different amounts of play with the sib's friends (Table 5). At the wide spacing, however, a significant relation to the

[5] We are indebted to Dr. Helen Heath for devising a method for testing the significance of the interactions. It should also be noted that, although our groups were matched, the error-of-the-difference term is computed on the basis of the assumption of uncorrelated groups. Hence, the estimates of the significance of differences are conservative ones. We may be guilty of Type B errors, i.e., assuming no significant relation when there is one.

TABLE 5

PERCENTAGE OF CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS WHO ALLEGED THEY PLAYED LITTLE, A MODERATE AMOUNT, OR MUCH WITH THE SIBLING'S FRIENDS

DESCRIPTION OF GROUP			ALLEGED AMOUNT OF PLAY WITH SIBLING'S FRIENDS											
Subject		Sibling	Little (per cent)				Medium (per cent)				Much (per cent)			
	Ordinal		AGE DIFFERENCE IN MONTHS BETWEEN SUBJECT AND SIBLING											
Sex	*Position*	*Sex*	*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*
M	2	M	40	60	47	49.0	40	20	33	31.0	20	20	20	20.0
M	2	F	47	67	73	62.3	27	20	14	20.0	27	13	13	17.7
F	2	M	60	73	53	62.0	13	27	40	26.7	27	0	7	11.3
F	2	F	40	47	60	49.0	33	33	33	33.0	27	20	7	18.0
M	1	M	60	60	60	60.0	7	33	27	22.3	33	7	13	17.7
M	1	F	27	47	100	58.0	26	26	0	18.0	47	27	0	24.7
F	1	M	40	73	73	62.0	47	27	20	31.3	13	0	7	6.7
F	1	F	47	53	80	60.0	7	27	20	18.0	47	20	0	22.3
M	2	M or F	43.5	63.5	60.0	55.7	33.5	20.0	23.5	25.6	23.5	16.5	16.5	18.8
F	2	M or F	50.0	60.0	56.5	55.5	23.0	30.0	36.5	29.8	27.0	10.0	7.0	14.7
M	1	M or F	43.5	53.5	80.0	59.0	16.5	29.5	13.5	19.8	40.0	17.0	6.5	21.2
F	1	M or F	43.5	63.0	76.5	61.0	27.0	27.0	20.0	24.7	30.0	10.0	3.5	14.5
M or F	2	M	50.0	66.5	50.0	55.5	26.5	23.5	36.5	28.8	23.5	10.0	13.5	15.7
M or F	2	F	43.5	57.0	66.5	55.7	30.0	26.5	23.5	26.5	27.0	16.5	10.0	17.8
M or F	1	M	50.0	66.5	66.5	61.0	27.0	30.0	23.5	26.8	23.0	3.5	10.0	12.2
M or F	1	F	37.0	50.0	90.0	59.0	16.5	26.5	10.0	17.6	47.0	23.5	0.0	23.5
M	1 or 2	M	50.0	60.0	53.5	54.5	23.5	26.5	30.0	26.7	26.5	13.5	16.5	18.8
M	1 or 2	F	37.0	57.0	86.5	60.1	26.5	23.0	7.0	18.8	37.0	20.0	6.5	21.2
F	1 or 2	M	50.0	73.0	63.0	62.0	30.0	27.0	30.0	29.0	20.0	0.0	7.0	9.0
F	1 or 2	F	43.5	50.0	70.0	54.5	20.0	30.0	26.5	25.5	37.0	20.0	3.5	20.2
M	1 or 2	M or F	43.5	58.5	70.0	57.3	25.0	24.8	18.5	22.8	31.8	16.8	11.5	20.0
F	1 or 2	M or F	46.8	61.5	66.5	58.3	25.0	28.5	28.2	27.2	28.5	10.0	5.2	14.6
M or F	1 or 2	M	50.0	66.5	58.2	58.2	26.8	26.8	30.0	27.9	23.2	6.8	11.8	13.9
M or F	1 or 2	F	40.2	53.5	78.2	57.3	23.2	26.5	16.7	22.1	37.0	20.0	5.0	20.7
M or F	2	M or F	46.8	61.8	58.2	55.6	28.2	25.0	30.0	27.7	25.2	13.2	11.8	16.7
M or F	1	M or F	43.5	58.2	78.2	60.0	21.7	28.2	16.8	22.2	35.0	13.5	5.0	17.8
M or F	1 or 2	M or F	45.1	60.0	68.2	57.8	24.9	26.6	23.4	24.9	30.1	13.4	8.4	17.3

Significant Differences	*p*
Play Little with Sib's Friends	
Spacing (7-24) vs. (25-48)	$< .05$
Spacing (7-24) vs. (49-72)	$< .01$
Interaction—sib's sex, spacing (7-24) vs. (49-72)	$< .05$
Interaction—sib's sex, spacing (25-48) vs. (49-72)	$< .01$
Play Medium Amount with Sib's Friends	
Interaction—child's sex, sib's sex, ordinal position, spacing (7-24) vs. (25-48)	$< .05$
Interaction—child's sex, sib's sex, ordinal position, spacing (7-24) vs. (49-72)	$< .05$
Play Much with Sib's Friends	
Spacing (7-24) vs. (49-72)	$< .01$
Interaction—sib's sex, spacing (25-48) vs. (49-72)	$< .05$

former variable is noted. The relative lack of relation to ordinal position was not predicted because it seemed reasonable to expect that the older sib would have more friends—i.e., he could share if he would—while the younger sib might be unable to do so because he had no, or very few, real friends, being too young. In the groups in which the sib was youngest (wide spacing, first-borns) our expectation was indeed confirmed, for here very infrequent association with the sib's friends was reported with a higher incidence by the first-borns than by the second children, and especially rare association, if the sib of the first-born was a female. It is worthy of note in connection with the above observations that, although few ordinal-position-group differences obtained in the matter of affirmed association with the sib's friends, the incidence of first-borns who expressed the opinion that they rarely played with the sib himself was less than the incidence of second-borns (data presented in an, as yet, unpublished reference), but it was the latter who the more frequently said they preferred to play with the sib than with other children. The above relations suggest that the lack of extensive ordinal-position-group differences in alleged frequency of association with sib's friends may result partly because freer access, or possibly even, greater inclination toward intercourse may, in the case of certain groups, be counterbalanced by less opportunity, the sib having fewer friends, or by rejection by the sib's friends.

At the close and middle spacings, with the exception of second-born boys, a higher incidence of the children with a female sib stated that they played much with the associates of the sib than did the children with a male sib, whereas at the wide spacing the trend was reversed, the latter difference, however, being slight. Congruently, a trend opposite to the above is to be noted when the report concerned very infrequent association with the sib's friends (Table 5). One hypothesis that might be offered for the phenomena just described is that when the spacing is not too wide, children tend to play with the sister's friends more than with the brother's, partly because sisters, especially first-borns, play more at home than do brothers. The relations outlined may, however, have other explanations. It seems not improbable, for instance, that the children may reject the brother's friends more than the sisters because the former's associates tend to be more vigorous, competitive, and combative, being predominantly male. It is relevant to note here that the teachers judged boys more hostile, exhibitionistic, and given to teasing (6). Though we think both hypotheses cogent, one might defend the converse of the one stated above, namely that the brother's friends may be more rejecting of *his sib* than the sister's friends are of *her sib* (12). Apropos of both hunches, let us call attention to the fact, though the difference is not quite significant, that first-borns whose sib was male affirmed more often that they felt badly treated by the latter's friends than did first-borns whose sib was a female (Table 6). The same condition obtained also in the case of second-born females in relation to first, but a contrary trend held for second-born males. A tendency

TABLE 6

PERCENTAGE OF CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS WHO ALLEGED THEY WERE TREATED BADLY, INDIFFERENTLY, OR WELL BY THE SIBLING'S FRIENDS

DESCRIPTION OF GROUP			QUALITY OF TREATMENT RECEIVED FROM SIBLING'S FRIENDS											
Subject		Sibling	Bad (per cent)				Indifferent (per cent)				Good (per cent)			
	Ordinal		AGE DIFFERENCE IN MONTHS BETWEEN SUBJECT AND SIBLING											
Sex	Position	Sex	7-24	25-48	49-72	Total	7-24	25-48	49-72	Total	7-24	25-48	49-72	Total
M	2	M	27	27	27	27.0	33	26	40	33.0	40	47	33	40.0
M	2	F	40	57	47	48.0	33	29	33	31.7	27	14	20	20.3
F	2	M	40	40	33	37.7	20	13	20	17.6	40	47	47	44.7
F	2	F	27	20	20	22.3	33	33	40	35.4	40	47	40	42.3
M	1	M	20	13	20	17.7	53	40	27	40.0	27	47	53	42.3
M	1	F	13	27	0	13.3	34	20	13	22.4	53	53	87	64.3
F	1	M	20	27	20	22.3	53	20	13	28.7	27	53	67	49.0
F	1	F	7	7	7	7.0	13	06	06	8.3	80	87	87	84.7
M	2	M or F	33.5	42.0	37.0	37.5	33.0	27.7	36.5	32.3	33.5	30.5	26.5	30.2
F	2	M or F	33.5	30.0	26.5	30.0	26.5	23.0	30.0	26.5	40.0	47.0	43.5	43.5
M	1	M or F	16.5	20.0	10.0	15.5	43.6	30.0	20.0	31.2	40.0	50.0	70.0	53.3
F	1	M or F	13.5	17.0	13.5	14.7	33.0	13.0	9.5	18.5	53.5	70.0	77.0	66.8
M or F	2	M	33.5	33.5	30.0	32.3	26.5	19.5	30.0	25.6	40.0	47.0	40.0	42.3
M or F	2	F	33.5	38.5	33.5	35.2	33.0	31.0	36.5	33.4	33.5	30.5	30.0	31.3
M or F	1	M	20.0	20.0	20.0	20.0	53.0	30.0	20.0	34.3	27.0	50.0	60.0	45.7
M or F	1	F	10.0	17.0	3.5	10.2	23.5	13.0	9.5	15.3	66.5	70.0	87.0	74.5
M	1 or 2	M	23.5	20.0	23.5	22.3	43.0	33.0	33.5	36.5	33.5	47.0	43.0	41.2
M	1 or 2	F	26.5	42.0	23.5	30.7	33.5	24.5	23.0	27.0	40.0	33.5	53.5	42.3
F	1 or 2	M	30.0	33.5	26.5	30.0	36.5	16.5	16.5	23.2	33.5	50.0	57.0	46.8
F	1 or 2	F	17.0	13.5	13.5	14.7	23.0	19.5	23.0	21.8	60.0	67.0	63.5	63.5
M	1 or 2	M or F	25.0	31.0	23.5	26.5	38.2	28.8	28.3	31.8	36.8	40.2	48.2	41.7
F	1 or 2	M or F	23.5	23.5	20.0	22.3	29.8	18.0	19.8	22.5	46.8	58.5	60.2	55.2
M or F	1 or 2	M	26.8	26.8	25.0	26.2	39.8	24.8	25.0	29.9	33.5	48.5	50.0	44.0
M or F	1 or 2	F	21.8	27.8	18.5	22.7	28.2	22.0	23.0	24.4	50.0	50.2	58.5	52.9
M or F	2	M or F	33.5	36.0	31.8	33.8	29.8	25.5	33.2	29.5	36.8	38.8	35.0	36.9
M or F	1	M or F	15.0	18.5	11.8	15.1	38.2	21.5	14.8	24.8	46.8	60.0	73.5	60.1
M or F	1 or 2	M or F	24.2	27.2	21.8	24.4	34.0	23.5	24.0	27.1	41.8	49.4	54.2	48.5

Significant Differences	*p*
Treated Badly	
Ordinal position	$< .01$
Interaction—child's sex, sib's sex	$\cong .01$
Treated Indifferently	
Interaction—sib's sex, ordinal position	$< .01$
Interaction—ordinal position, spacing (7-24) vs. (49-72)	$< .05$
Treated Well	
Child's sex	$< .05$
Ordinal position	$< .01$
Interaction—sib's sex, ordinal position	$< .01$
Interaction—ordinal position, spacing (7-24) vs. (49-72)	$< .05$

the reverse of the one just sketched was evident, consistently enough, when excellent treatment was the item investigated (Table 6). Somewhat difficult to reconcile with the second hypothesis stated above, however, is the observation that second-born males with a male sib tended to allege good treatment at the hands of the sib's friends more often, and associated more with the sib's friends, than did those males with an older sister (Tables 6, 5). Strangely also, the M2F's, of all the male groups, expressed with the highest frequency a preference for play with girls (Table 11). The boy with an older sister, hence, seems very ambivalent to her and she probably with respect to him. Consistent with the latter hunch is the fact that the girl with a younger brother (this is the sib type of the M2F's) confessed with the highest frequency of all female groups that she preferred to play with someone other than her sib and also that she would rather play alone than play with the sib (data not yet published). Among males sex distance seems to make itself felt to a greater degree in second-borns than firsts, (*see also* 3). The boy seems upset more by an older sister and her friends than by a younger. A similar ordinal-position difference in the case of the girls is not clearly apparent.

It is interesting that the M2F's, of all groups, named the fewest playmates (Table 7). Possibly this group was more indulged and protected by their mothers and, hence, more frequently felt abused by their peers or were less confident they could hold their own with the latter. These boys also seemed not too comfortable in their sex identification.

We confess, when we asked the children about playing with the sib's friends, we wondered whether those near to the sib in age could discriminate who was whose friend. Possibly, the first-born boys recognized the sib's friends as different from their own more readily when the sib and associates were opposite in sex and thus the boys may have reported more association with the sib's friends when the sib was female than when male. However, if this hunch is correct, one might expect a similar mechanism to operate in the case of girls with a brother but the results here are not congruent with the expectation (Table 5).

About half of the children (14 to 87 per cent, depending on the group) asserted they were treated well by the sib's friends; a fourth, that they were treated indifferently or only sometimes were dealt with badly; and about a fourth, that they were generally abused by the sib's friends (Table 6). The question form was, "Do ———'s friends usually treat you well (nice)? Or do they usually treat you badly? Or do they treat you badly only sometimes (only once in a while)?" If the question was not understood, we asked "Are ———'s friends usually nice to you, or are they usually not nice? Or are they sometimes nice and sometimes not?" To a greater degree, as the sib age disparity expanded, the first-borns affirmed they fared well at the hands of the sib's friends. These older children were, no doubt, held in esteem by the younger sib's playmates because of the prestige of age. First-borns, generally, with a higher incidence than

second-borns, declared their association with the sib's friends were pleasant and, conversely, fewer thought the friends were abusive. Thus, the younger children in the sib pairs more frequently felt ill-treated.

As implied earlier, when the sibs were opposite in sex, the frequency of affirmation of bad treatment by the sib's coterie of friends was higher than when the sibs were of the same sex. (About 30 per cent of the former and 18 per cent of the latter confessed abuse; *see* Table 6.) We think inter-sex rivalry, or what we have called sex distance (3), is operating to produce this result. Since the reverse pattern is not to be observed in the case of first-born boys and second-born girls, when the affirmation of good treatment is the variable focused upon, this may leave us with something to explain. It is possible that the boy, when he is older than his girl associates, is likely, even if quite young, to show some "chivalry" and the girl may succumb to amorous interests. When we talked with the children, dozens of times they spoke seriously of their girl friends or boy friends. Perhaps, hence, the girl with an older brother is the recipient of "chivalry" and devotion from some of his friends and thus feels fairly well treated. The obverse picture we see in the boy with a younger sister. Being older he may react chivalrously or loyally to some of the younger sister's friends as well as be the recipient of devotion from some of these. As stated, it seems probable that it is when the male is the older that appreciative and cooperative attitudes may be exhibited in relation to some of his sib's friends, if they are girls, which, of course, they are more likely to be, if the sib is a girl. The boy's rivalrous attitudes, on the other hand, we should expect to be more in evidence if he is younger than the sib's friends and fighting for status. This may account for the jealousy and rivalry of the M2F's, reported by the teachers (6), as well as their feeling of abuse, and the corresponding jealousy and rivalry of F1M's, who may be the targets of the younger brother's envious boy companions.

The F1F's most frequently (incidence about 85 per cent) felt the sib's friends were friendly, while the M2F's least often reported good treatment (20 per cent) (Table 6).

It is interesting that boys less frequently than girls believed they were dealt with very appreciatively by the sib's playmates but not significantly more frequently that they were treated very badly (Table 6). The boys, because they tend to be more combative, may actually experience more rejection than the girls. [Teachers judged the girls more popular (6). *See also* Tuddenham (15).] But, because they are more rough-and-tumble in their activities, they may not see so readily the sib's friends' behavior as abusive.

It is worthy of comment that if our 24 groups are ranked on the basis of alleged infrequency of association and of frequency of report of bad treatment from the sib's friends and these two sets of ranks are correlated, the rho equals only +.09. Hence, the two measures, treatment quality and amount of association, seem quite independent. Possibly the more the

children played together the more opportunities there were, in the main, for clashes [*see* Green (2); Murphy (11)]. This relation may have countered or masked other positive influences.

Following is a brief summary of the findings of this section: (1) As the sib age difference increased, our subjects, whether first- or second-born, reported they played less frequently with their sib's friends. (2) Our subjects did not seem to think they associated much with the sib's friends. In no case did as many as half of a group express the belief association was very frequent. (3) The incidence of report of much play with the sib's friends was higher among the children, whether male or female, with a

TABLE 7

MEAN NUMBER OF CHILDREN NAMED AS PLAYMATES BY CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS

DESCRIPTION OF GROUP				AGE DIFFERENCE BETWEEN SUBJECT AND SIBLING IN MONTHS			
Subject		Sibling					
Sex	*Ordinal Position*	*Sex*		*7–24*	*25–48*	*49–72*	*Total*
M	2	M	.....	3.93	3.53	4.33	3.93
M	2	F	.....	3.73	3.67	3.73	3.71
F	2	M	.....	4.07	4.60	4.13	4.26
F	2	F	.....	3.73	4.00	4.27	4.00
M	1	M	.....	4.47	4.13	3.72	4.11
M	1	F	.....	4.40	4.00	3.60	4.00
F	1	M	.....	4.60	3.80	4.87	4.42
F	1	F	.....	4.93	4.07	4.07	4.36
M	2	M or F	.....	3.83	3.60	4.03	3.82
F	2	M or F	.....	3.90	4.30	4.20	4.13
M	1	M or F	.....	4.44	4.06	3.66	4.05
F	1	M or F	.....	4.76	3.94	4.47	4.39
M or F	2	M	.....	4.00	4.06	4.23	4.10
M or F	2	F	.....	3.73	3.84	4.00	3.86
M or F	1	M	.....	4.54	3.96	4.30	4.27
M or F	1	F	.....	4.66	4.04	3.84	4.18
M	1 or 2	M	.....	4.20	3.84	4.02	4.02
M	1 or 2	F	.....	4.06	3.84	3.66	3.85
F	1 or 2	M	.....	4.34	4.20	4.50	4.35
F	1 or 2	F	.....	4.33	4.04	4.17	4.18
M	1 or 2	M or F	.....	4.13	3.83	3.84	3.93
F	1 or 2	M or F	.....	4.33	4.12	4.34	4.26
M or F	1 or 2	M	.....	4.27	4.02	4.26	4.18
M or F	1 or 2	F	.....	4.20	3.94	3.92	4.02
M or F	2	M or F	.....	3.86	3.95	4.12	3.98
M or F	1	M or F	.....	4.60	4.00	4.06	4.22
M or F	1 or 2	M or F	.....	4.23	3.98	4.09	4.10

sister 7 to 48 months younger than among the children with a brother 7 to 48 months younger. (4) About half of the children said they were dealt with well by the sib's friends and about a fourth that they were usually abused. (5) Girls more often than boys thought the sib's associates accepting and cooperative but, while sex differences were significant in the incidence of report of very friendly treatment, they were not significant in the case of the frequency of report of abuse. (6) Second-borns confessed they fared less well at the hands of the sib's friends than did first-borns. (7) Among those with a sister, ordinal-position differences in alleged excellent treatment from the sib's associates were significant ($1 > 2$), whereas, in the case of those children with a brother, ordinal-position differences were negligible. (8) First-borns, in the groups with the wider sib-age disparity, more frequently viewed the sib's friends as accepting, while second-borns showed no spacing-group differences. (9) If the sib was of the opposite sex, it was maintained more often by the child that the sib's friends were abusive than if the sib was of the same sex. (10) Boys with a younger sister more often thought they were treated well by the sib's friends than did boys with a younger brother but the reverse sib's-sex-group relation obtained among second-born boys. (11) If the measures paired are for groups, the reported frequency of association with the sib's friends and the alleged quality of treatment received from the latter were not significantly correlated.

Number of Playmates

When the children were asked to name their playmates, they mentioned, depending on the subgroup, 3.53 to 4.93, on the average (Table 7). The number of playmates a child listed did not seem correlated to a significant degree with any of the sibling characteristics studied. It may be worth noting, however, that M2F's, quite consistent with other data we have offered (6), reported, on the average, the fewest playmates, while F1M's, the sib type of the M2F's, mentioned the most. Girls generally named more friends or playmates than did boys. We might think this a mere friendship-standard difference in the two sexes and no correlate of the actual, were it not for the fact the girls were judged by their teachers more friendly to their peers than were the boys (6).

Relative Age of Child Associates and Friends

We were often surprised, when we asked the question, "Who is your very best friend?," to find that the children not infrequently specified some adult. When we made it clear it was the best friend among children we wanted to know about, we discovered that the child named was often one who was no longer currently available because he had moved away, or had been met some time before at a camp, on a trip, or on a visit to

relatives. Possibly "absence makes the heart grow fonder" or in a brief association, relations do not get beyond the best-foot-forward or idyllic stage and so are remembered very fondly. At any rate, because we knew that the best friend did not necessarily represent a choice among the child's present contacts, we also asked which child among all the playmates who

TABLE 8

PERCENTAGE OF PLAYMATES NAMED BY THE CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS WHO WERE ALLEGED TO BE OLDER, ABOUT THE SAME AGE, OR YOUNGER THAN THE SUBJECT

DESCRIPTION OF GROUP			RELATIVE AGE OF PLAYMATES NAMED											
Subject		Sibling	Older (per cent)				Same Age (per cent)				Younger (per cent)			
	Ordinal		AGE DIFFERENCE IN MONTHS BETWEEN SUBJECT AND SIBLING											
Sex	Position	Sex	7-24	25-48	49-72	Total	7-24	25-48	49-72	Total	7-24	25-48	49-72	Total
M	2	M	43	40	35	39.3	36	48	43	42.3	21	12	22	18.3
M	2	F	39	38	30	35.7	46	50	48	48.0	15	12	22	16.3
F	2	M	34	49	36	39.7	58	32	49	46.3	8	19	15	14.0
F	2	F	41	28	27	32.0	41	49	51	47.0	18	23	22	21.0
M	1	M	24	24	23	23.7	49	52	54	51.7	27	24	23	24.7
M	1	F	23	33	15	23.7	52	40	59	50.3	25	27	26	26.0
F	1	M	22	27	32	27.0	53	41	44	46.0	25	32	24	27.0
F	1	F	30	30	27	29.0	41	42	48	43.7	29	28	25	27.3
M	2	M or F	41.0	39.0	32.5	37.5	41.0	49.0	45.5	45.2	18.0	12.0	22.0	17.3
F	2	M or F	37.5	38.5	31.5	35.8	49.5	40.5	50.5	46.8	13.0	21.0	18.5	17.5
M	1	M or F	23.5	28.5	19.0	23.7	50.5	46.0	56.5	51.0	26.0	25.5	24.5	25.3
F	1	M or F	26.0	28.5	29.5	28.0	47.0	41.5	46.0	44.8	27.0	30.0	24.5	27.2
M or F	2	M	38.5	44.5	35.5	39.5	47.0	40.0	46.0	44.3	14.5	15.5	18.5	16.2
M or F	2	F	40.0	33.0	28.5	33.8	43.5	49.5	49.5	47.5	16.5	17.5	22.0	18.7
M or F	1	M	23.0	25.5	27.5	25.3	51.0	46.5	49.5	49.0	26.0	28.0	23.5	25.8
M or F	1	F	26.5	31.5	21.0	26.3	46.5	41.0	53.5	47.0	27.0	27.5	25.5	26.7
M	1 or 2	M	33.5	32.0	29.0	31.5	42.5	50.0	48.8	47.1	24.0	18.0	22.5	21.5
M	1 or 2	F	31.0	35.5	22.5	29.7	49.0	45.0	53.5	49.2	20.0	19.5	24.0	21.2
F	1 or 2	M	28.0	38.0	34.0	33.3	55.5	36.5	46.5	46.2	16.5	25.5	19.5	20.5
F	1 or 2	F	35.5	29.0	27.0	30.5	41.0	45.5	49.5	45.3	23.5	25.5	23.5	24.2
M	1 or 2	M or F	32.2	33.8	25.8	30.6	45.7	47.5	51.3	48.1	22.0	18.8	23.2	21.3
F	1 or 2	M or F	31.8	33.5	30.5	31.9	48.3	41.0	48.0	45.8	20.0	25.5	21.5	22.3
M or F	1 or 2	M	30.8	35.0	31.5	32.4	49.0	43.3	47.6	46.6	20.2	21.8	21.0	21.0
M or F	1 or 2	F	33.2	32.2	24.8	30.1	45.0	45.3	51.2	47.2	21.8	22.5	23.8	22.7
M or F	2	M or F	39.2	38.8	32.0	36.7	45.3	44.8	48.0	46.0	15.5	16.5	20.2	17.4
M or F	1	M or F	24.8	28.5	24.2	25.8	48.8	44.0	51.2	48.0	26.5	27.8	24.5	26.3
M or F	1 or 2	M or F	32.0	33.6	28.1	31.2	47.0	44.3	49.5	46.9	21.0	22.2	22.4	21.9

Significant Differences	*p*
Playmates Older	
Ordinal position	$< .05$
Playmates Same Age	
Interaction—child's sex, sib's sex, spacing (7-24) vs. (25-48)	$< .05$

had been listed was liked the best. This choice we have labelled the "preferred playmate." The playmates a young city child has probably do not represent his basic choice to the same degree as do his verbally expressed preferences. The associates named reflect in a measure what the very immediate neighborhood affords the child in the way of companions; the best friend and preferred playmate, in contrast, probably are influenced more by the child's values, identifications and aspirations.

The children tended to mention as playmates, as best friend, and best-liked playmate youngsters of their own age (i.e., differing by less than one year) more frequently than youngsters who were older or younger than they (Tables 8-10). The ages of the playmates named were determined from the school record when possible, the report of an older sib, or were inferred, when no other data were available, from what the child told us about the playmate. If he reported, for instance, the playmate was in the fourth grade in some school, we knew he was older; if the playmate was described as not yet able to talk, we knew he was younger than the child. Depending on the group, about 32 to 59 per cent of the alleged playmates were, as far as we could determine this, of the child's age; 15 to 49 per cent, older; and 12 to 32 per cent younger. It is noteworthy that more of the playmates, best friends, and preferred playmates listed by the child were older than were younger than he. This may reflect a tendency toward upward striving on the part of the children, or, in part at least, that more of these older children were available. Since the older sibling might well have more playmates than the younger, the incidence of the playmates listed who exceeded the child in years and the frequency with which the child specified as best friend someone who was older is a function, in part, of the ordinal position (Tables 8-9). As was expected, the proportion of those with an older sib who mentioned playmates with more years than they was greater than in the case of first-borns. The ordinal-position group difference was greatest at the under-two-year spacing (Table 8), being insignificant at the spacing beyond. When the sib was of lesser age, the percentage of alleged younger playmates was, as anticipated, higher than when the sib was of a greater age but this difference was not quite large enough to be significant (Table 8).

The preference of the second-born for the older associate is shown most clearly in the case of the best friend and preferred playmate data, at the close spacing, just as in the case of the listed playmates (Tables 7-10). As the sib-age disparity increased, the percentage of the best friends of second-borns who were older decreased and the percentage of best friends who were younger increased (Table 9). The trends in the case of preferred playmate are similar but group differences are not of sufficient magnitude to be significant (Table 10). The incidence of preferred playmates of the same age increased with spacing for second-borns. In other words, the wider the spacing, the less influence the older sib seems to have in determining whom the child views with most favor. Apparently, the older sib, if

TABLE 9

PERCENTAGE OF THE CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS WHO NAMED AS "BEST FRIEND" A CHILD WHO WAS OLDER, ABOUT THE SAME AGE, OR YOUNGER THAN THEY

DESCRIPTION OF GROUP				RELATIVE AGE OF "BEST FRIEND"											
Subject		Sibling		Older (per cent)				Same Age (per cent)				Younger (per cent)			
	Ordinal			AGE DIFFERENCE IN MONTHS BETWEEN SUBJECT AND SIBLING											
Sex	*Position*	*Sex*		*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*
M	2	M		50	47	27	41.3	50	33	66	49.7	0	20	7	9.0
M	2	F		53	40	20	37.7	40	53	47	46.6	7	7	33	15.7
F	2	M		33	60	47	46.7	60	33	26	39.6	7	7	27	13.7
F	2	F		60	20	47	42.3	40	53	40	44.4	0	27	13	13.3
M	1	M		36	40	40	38.7	50	47	55	50.6	14	13	7	11.3
M	1	F		13	43	27	27.7	80	43	33	52.0	7	14	40	20.3
F	1	M		33	27	13	24.3	47	66	54	55.7	20	7	33	20.0
F	1	F		7	53	33	31.0	50	40	54	48.0	43	7	13	21.0
M	2	M or F		51.5	43.5	23.5	39.5	45.0	43	56.5	48.1	3.5	13.5	20.0	12.3
F	2	M or F		46.5	40.0	47.0	44.5	50.0	43	33.0	42.0	3.5	17.0	20.0	13.5
M	1	M or F		24.5	41.5	33.5	33.4	65.0	45	44.0	51.3	10.5	13.5	23.5	15.8
F	1	M or F		20.0	40.0	23.0	27.7	48.5	53	54.0	51.8	31.5	7.0	23.0	20.5
M or F	2	M		41.5	53.5	37.0	44.0	55.0	33.0	46.0	44.7	3.5	13.5	17.0	11.3
M or F	2	F		56.5	30.0	33.5	40.0	40.0	53.0	43.5	45.5	3.5	17.0	23.0	14.5
M or F	1	M		34.5	33.5	26.5	31.5	48.5	56.5	54.5	53.2	17.0	10.0	20.0	15.7
M or F	1	F		10.0	48.0	30.0	29.3	65.0	41.5	43.5	50.0	25.0	10.5	26.5	20.7
M	1 or 2	M		43.0	43.5	33.5	40.0	50	40.0	60.5	50.2	7.0	16.5	7.0	10.2
M	1 or 2	F		33.0	41.5	23.5	32.7	60	48.0	40.0	49.3	7.0	10.5	36.5	18.0
F	1 or 2	M		33.0	43.5	30.0	35.5	53.5	49.5	40.0	47.7	13.5	7.0	30.0	16.8
F	1 or 2	F		33.5	36.5	40.0	36.7	45.0	46.5	47.0	46.2	21.5	17.0	13.0	17.2
M	1 or 2	M or F		38.0	42.5	28.5	36.3	55.0	44.0	50.3	49.7	7.0	13.5	21.8	14.1
F	1 or 2	M or F		33.2	40.0	35.0	36.1	49.3	48.0	43.5	46.9	17.5	12.0	21.5	17.0
M or F	1 or 2	M		38.0	43.5	31.8	37.8	51.7	44.7	50.3	48.9	10.2	11.8	18.5	13.5
M or F	1 or 2	F		33.2	39.0	31.8	34.7	52.5	47.2	43.5	47.7	14.2	13.8	24.8	17.6
M or F	2	M or F		49.0	41.8	35.2	42.0	47.5	43.0	44.8	45.1	3.5	15.2	20.0	12.9
M or F	1	M or F		22.2	40.8	28.2	30.4	56.5	49.0	49.0	51.5	21.0	10.2	23.2	18.1
M or F	1 or 2	M or F		35.6	41.3	31.7	36.2	52.1	46.0	46.9	43.3	12.2	12.7	21.7	15.5

Significant Differences	*p*
Best Friend Older	
Ordinal position	$< .05$
Interaction—ordinal position, spacing (7-24) vs. (25-48)	$< .05$
Interaction—sib's sex, ordinal position, spacing (7-24) vs. (25-48)	$< .01$
Best Friend Same Age	
Interaction—sib's sex, ordinal position, spacing (7-24) vs. (25-48)	$> .01$
Interaction—child's sex, ordinal position, spacing (7-24) vs. (49-72)	$< .05$
Best Friend Younger	
Spacing (7-24) vs. (49-72)	$> .05$
Interaction—ordinal position, spacing (7-24) vs. (25-48)	$< .01$
Interaction—child's sex, sib's sex, spacing (7-24) vs. (25-48)	$< .01$
Interaction—child's sex, sib's sex, spacing (7-24) vs. (49-72)	$< .01$
Interaction—child's sex, sib's sex, ordinal position, spacing (7-24) vs. (25-48)	$< .05$

near in age, has more influence than the younger in building in the child a preference for, or creating opportunities for associating with, playmates who differ in the same direction in age as the sib. As has been said, the finding is probably in part a function of the general upward striving of children but, in addition, the hypothesis seems cogent that because the preschool child does not play so much out of the home as the school-age child does, the children brought in for play at home, or who live in the immediate neighborhood of the home, are to a considerable degree those the older sib contacts. The playmates may also be those who are at least old enough so that their parents are willing to let them visit the neighbors and be briefly out of sight.

The fact that the second-borns more frequently had older associates and hence had to struggle to keep up may account for our finding that second-borns did better than first-borns on the Thurstone Primary Abilities Test (4). The fact of the former's being more frequently outclassed may also be related to the fact they were rated less self-confident, competitive, and insistent on their rights (6). If the spacing is wide, the association with the sib's friends tends to be low, whether the sib is older or younger (Table 5).

In the case of first-borns the middle-spacing level showed a higher frequency of best friends older than the child, and a lower frequency of best friends younger, or of the same age (Table 9). This is the spacing at which other data we have suggest the first-born is particularly conflictful (6). His more frequent selection of an older child as best friend than is the case with children who have a sib very near in age, we think, may be a sign of status-striving as well as the relaxing of the influence of the sib, and a reaching of the child out of the home for companionship. The more-than-two-years younger sib and his associates are no doubt not very stimulating. The more frequent choice of an older best friend may also reflect to some extent the interests and values built up when the child was an only and associated chiefly with adults. If the latter were a very potent force, we should expect the preference for older child associates would be greatest among first-borns at the widest spacing. This is not the case (Table 9). A trend similar to the former, though not so marked, is shown among the data concerned with the preferred playmate (Table 10). It is suggestive that the group at the middle spacing, who, we think, are turning away from the sib and striving for a place with children outside of the home, were rated by their teachers as notably friendly to peers (6).

It is of interest that at the wide spacing those from opposite-sex sibling pairs tended to name more frequently as best friend a child who was younger than did those from same-sex pairs and less frequently some one their own age (Table 9). How seriously this finding should be taken is a question, since the various indexes of association do not point consistently in the same direction. It is possible, however, a second-born whose sib is of his own sex may, even though the age gap is wide, still try to keep up

TABLE 10

PERCENTAGE OF THE CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS WHOSE PREFERRED PLAYMATE WAS YOUNGER, ABOUT THE SAME AGE, OR OLDER THAN THEY

DESCRIPTION OF GROUP			RELATIVE AGE OF PREFERRED PLAYMATE											
Subject		Sibling	Older (per cent)				Same Age (per cent)				Younger (per cent)			
	Ordinal		AGE DIFFERENCE IN MONTHS BETWEEN SUBJECT AND SIBLING											
Sex	*Position*	*Sex*	*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*
M	2	M	50	33	33	38.7	43	67	67	59.0	7	0	0	2.3
M	2	F	54	23	40	39.0	38	62	40	46.7	8	15	20	14.3
F	2	M	33	40	43	38.7	60	47	50	52.3	7	13	7	9.0
F	2	F	60	13	27	33.3	27	60	46	44.4	13	27	27	22.3
M	1	M	29	40	36	35.0	57	40	43	46.7	14	20	21	18.3
M	1	F	27	43	13	27.7	60	36	54	50.0	13	21	33	22.3
F	1	M	27	20	54	33.7	60	67	31	52.7	13	13	15	13.7
F	1	F	27	43	47	39.0	46	43	26	38.3	27	14	27	22.7
M	2	M or F	52.0	28.0	36.5	38.8	40.5	64.5	53.5	52.8	7.5	7.5	10.0	8.3
F	2	M or F	46.5	26.5	35.0	36.0	43.5	53.5	48.0	48.3	10.0	20.0	17.0	15.7
M	1	M or F	28.0	41.5	24.5	31.3	58.5	38.0	48.5	48.3	13.5	20.5	27.0	20.3
F	1	M or F	27.0	31.5	50.5	36.3	53.0	55.0	28.5	45.5	20.0	13.5	21.0	18.2
M or F	2	M	41.5	36.5	38.0	38.7	51.5	57.0	58.5	55.7	7.0	6.5	3.5	5.7
M or F	2	F	57.0	18.0	33.5	36.2	32.5	61.0	43.0	45.5	10.5	21.0	23.5	18.3
M or F	1	M	28.0	30.0	45.0	34.3	58.5	53.5	37.0	49.7	13.5	16.5	18.0	16.0
M or F	1	F	27.0	43.0	30.0	33.3	53.0	39.5	40.0	44.2	20.0	17.5	30.0	22.5
M	1 or 2	M	39.5	36.5	34.5	36.8	50.0	53.5	55.0	52.8	10.5	10.0	10.5	10.3
M	1 or 2	F	40.5	33.0	26.5	33.3	49.0	49.0	47.0	48.2	10.5	18.0	26.5	18.3
F	1 or 2	M	30.0	30.0	48.5	36.2	60.0	57.0	40.5	52.5	10.0	13.0	11.0	11.3
F	1 or 2	F	43.5	28.0	37.0	36.2	36.5	51.5	36.0	41.3	20.0	20.5	27.0	22.5
M	1 or 2	M or F	40.0	34.8	30.5	35.1	49.5	51.2	51.0	50.6	10.5	14.0	18.5	14.3
F	1 or 2	M or F	36.8	29.0	42.8	36.2	48.2	54.2	38.2	46.9	15.0	16.8	19.0	16.9
M or F	1 or 2	M	34.8	33.2	41.5	36.5	55.0	55.2	47.8	52.7	10.2	11.5	10.8	10.8
M or F	1 or 2	F	42.0	30.5	31.8	34.8	42.7	50.2	41.5	44.8	15.2	19.2	26.8	20.4
M or F	2	M or F	49.2	27.2	35.8	37.4	42.0	59.0	50.8	50.6	8.8	13.8	13.5	12.0
M or F	1	M or F	27.5	36.5	37.5	33.8	55.7	46.5	38.5	46.9	16.8	17.0	24.0	19.3
M or F	1 or 2	M or F	38.4	31.8	36.6	35.6	48.8	52.8	44.6	48.7	12.8	15.4	18.8	15.7

Significant Differences	*p*
Preferred Playmate Older	
Interaction—ordinal position, spacing (7-24) vs. (25-48)	$< .05$
Interaction—sib's sex, ordinal position, spacing (7-24) vs. (25-48)	$\cong .05$
Preferred Playmate Same Age	
Interaction—ordinal position, spacing (7-24) vs. (25-48)	$< .05$
Interaction—ordinal position, spacing (7-24) vs. (49-72)	$< .05$
Preferred Playmate Younger	
Sib's sex	$< .05$

with the sib and its associates. This identification with the older group may cause the M2M's and F2F's to be somewhat scornful of younger children and thus less willing to have as a best friend some one who is younger than is the case among those second-borns from opposite-sex pairs. In the latter case the members of sib pairs have low identification and sib contact because of both sex and age distance. The best friend chosen by the latter may represent, in contrast to the list of playmates given, choice less influenced by the arrangements the sib effects. Also we have noted those who have a much older sib opposite in sex tended to be somewhat withdrawn and dependent (5, 6). It is our opinion that they were protected and babied more than the second-borns from the same sex sibling pairs and hence probably were more inclined to select as best friend a younger child—i.e., one who was less dominant relative to them, as well as one more likely to be found around the home (hence probably a preschooler). The situation in the case of first-borns at the wide spacing, it seems reasonable to suspect, is somewhat different from that obtaining for the second-borns. In the former case, since the sib is virtually an infant, it can have very little direct effect. These first-born children have long been only children, and those in opposite-sex pairs, evidence we have leads us to believe, are more jealous and uncertain of their status than those from identical-sex pairs (6). With a greater frequency they expressed a desire to change places with the sib, for instance, when questioned in the interview (data not yet published). One might, accordingly, expect them to cling, to hang around home more, and possibly even select as best friend some one who was more in the image of the sib, or at least not difficult to deal with.

It is noteworthy that when preferred playmates are considered, in contrast to the best friends, which represent a less realistic preference as well as a less dependable index, those subjects with a sister showed a higher incidence of choice of playmates who were younger (Table 10). Possibly those with a sister had become inured because of the lesser aggressiveness of the female sib to a milder type of companion, a consideration that might give the younger child somewhat greater appeal as a playmate than the somewhat older.

A summary of the findings relative to playmate age follows: (1) The playmates mentioned, the preferred playmate and the best friend were most frequently of about the child's own age but were with a higher incidence older than younger, relative to the child. (2) The first-borns somewhat more frequently named as playmates, as preferred playmate, or as best friend, children with fewer years than themselves than did the second-borns. (3) The incidence of listed playmates, of preferred playmates, or of best friends who were older was significantly greater among second-borns than among first- only at the closest spacing. The incidence of older best friends and of older preferred playmates decreased among second-borns as the sib-age disparity expanded from under-two to two-to-

TABLE 11

PERCENTAGE OF THE CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS WHO PREFERRED TO PLAY WITH BOYS, WERE INDIFFERENT TO SEX OF PLAYMATES, OR WHO PREFERRED TO PLAY WITH GIRLS

DESCRIPTION OF GROUP			PREFERENCE AS TO SEX OF PLAYMATES											
Subject	Sibling		Male (%)				Female (%)				No Preference (%)			
	Ordinal		AGE DIFFERENCE IN MONTHS BETWEEN SUBJECT AND SIBLING											
Sex	*Position*	*Sex*	*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*
M	2	M	60	73	60	64.3	13	7	13	11.0	27	20	27	24.7
M	2	F	33	80	67	60.0	40	7	20	22.3	27	13	13	17.7
F	2	M	7	13	7	9.0	53	60	66	59.7	40	27	27	31.3
F	2	F	13	7	0	6.7	47	93	80	73.3	40	0	20	20.0
M	1	M	53	87	73	71.0	0	0	20	6.7	47	13	7	22.3
M	1	F	33	33	53	39.7	14	14	20	16.0	53	53	27	44.3
F	1	M	7	33	20	20.0	46	54	53	51.0	47	13	27	29.0
F	1	F	0	0	13	4.3	60	67	67	64.7	40	33	20	31.0
M	2	M or F	46.5	76.5	63.5	62.2	26.5	7.0	16.5	16.7	27.0	16.5	20.0	21.2
F	2	M or F	10.0	10.0	3.5	7.8	50.0	76.5	73.0	66.5	40.0	13.5	23.5	25.7
M	1	M or F	43.0	60.0	63.0	55.3	7.0	7.0	20.0	11.3	50.0	33.0	17.0	33.3
F	1	M or F	3.5	16.5	16.5	12.2	53.0	60.5	60.0	57.8	43.5	23.0	23.5	30.0
M or F	2	M	33.5	43.0	33.5	36.7	33.0	33.5	39.5	35.3	33.5	23.5	27.0	28.0
M or F	2	F	23.0	43.5	33.5	33.3	43.5	50.0	50.0	47.8	33.5	6.5	16.5	18.8
M or F	1	M	30.0	60.0	46.5	45.5	23.0	27.0	36.5	28.8	47.0	13.0	17.0	25.7
M or F	1	F	16.5	16.5	33.0	22.0	37.0	40.5	43.5	40.3	46.5	43.0	23.5	37.7
M	1 or 2	M	56.5	80.0	66.5	67.7	6.5	3.5	16.5	8.8	37.0	16.5	17.0	23.5
M	1 or 2	F	33.0	56.5	60.0	49.8	27.0	10.5	20.0	19.2	40.0	33.0	20.0	31.0
F	1 or 2	M	7.0	23.0	13.5	14.5	49.0	57.0	59.5	55.2	43.5	20.0	27.0	30.2
F	1 or 2	F	6.5	3.5	6.5	5.5	53.5	80.0	73.5	69.0	40.0	16.5	20.0	25.5
M	1 or 2	M or F	44.8	68.2	63.2	58.7	16.7	7.0	18.2	13.8	38.5	24.8	18.5	27.3
F	1 or 2	M or F	6.8	13.2	10.0	10.0	51.5	68.5	66.5	62.2	41.8	18.2	23.5	27.8
M or F	1 or 2	M	31.8	51.5	40.0	41.1	28.0	30.2	38.0	32.1	40.2	18.2	22.0	26.8
M or F	1 or 2	F	19.8	30.0	33.2	27.7	40.2	45.2	46.8	44.0	40.0	24.8	20.0	28.3
M or F	2	M or F	28.2	43.2	33.5	35.0	38.2	41.8	44.8	41.6	33.5	15.0	21.8	23.4
M or F	1	M or F	23.2	38.2	39.8	33.7	30.0	33.8	40.0	34.6	46.8	28.0	20.2	31.7
M or F	1 or 2	M or F	25.7	40.7	36.6	34.3	34.1	37.8	42.4	38.1	40.2	21.5	21.0	27.6

Significant Differences	*p*
Male Preference	
Child's sex	$< .01$
Sib's sex	$< .01$
Spacing (7-24) vs. (25-48)	$< .05$
Interaction—sib's sex, ordinal position	$< .05$
Female Preference	
Child's sex	$< .01$
Interaction—child's sex, spacing (7-24) vs. (25-48)	$< .05$
No Preference	
Spacing (7-24) vs. (25-48)	$< .01$
Spacing (7-24) vs. (49-72)	$< .01$
Interaction—sib's sex, ordinal position, spacing (7-24) vs. (25-48)	$\cong .05$

four years, while the percentage of best friends and of preferred playmates of first-borns who were older than the child increased from the close to the middle sib-age-difference level. (5) Second-borns at the spacings greater than two years mentioned as the playmate liked best a child their own age more frequently than did first-borns, whereas at the close spacing the relation was reversed. (6) Those with a female sib named in greater numbers as preferred playmate a child who was younger than did those with a male sib. (7) At the over-four-year sib-age-difference level those from opposite-sex pairs tended to specify more frequently as best friend a child who was younger than did those from same-sex pairs.

Sex Preference in Playmates

Our subjects generally preferred, and had, playmates of their own sex. This trend was revealed in the case of the children listed as playmates, those named as best friend and as the playmate liked the best, as well as in the case of the stated sex preference (Tables 11-14). Thirty-three to 93 per cent of the children, depending on the group, when asked, "Would you rather play with boys, or with girls, or doesn't it make any difference?," expressed a preference for associates of their own sex (Table 11). The finding is congruent with the sex-distance finding which we reported in Reference (3). When the children were asked why they had their particular preference, the reasons usually given were liking for some of the favorite amusements or games of the same sex, though often prejudice against such traits as roughness, disobedience, and unwillingness to share (all attributed more frequently to boys) were mentioned. Occasionally the children were unable to offer any justification for their choice, asserting merely that they preferred a given sex just because they did, or that one sex was nicer than the other. Boys more frequently than girls mentioned sex, the negative traits, and play interests as the bases for choice. Girls more frequently mentioned positive personal qualities and service. Very seldom (three cases) was the response indicating direct social pressure, such as "My mamma wants me to" noted. It appears, then, that even by five years greater congeniality exists between the members of a given sex than between those not similar in sex. How much of this is culturally determined and how much is due to differences rooted in the genes is a question. We have the suspicion that in the first stage, when the individual is embracing a social role or identification, he tends to exclude or reject that which is in contrast. To play well the girl's role, for instance, the girl may feel she must reject boys and whatever is masculine. Later, when sex identification is well established and/or society exerts pressure to bring the sexes together, the tendency to reject will doubtless be reduced. How much rejection occurs, it seems reasonable to assume, may be dependent on how much opportunity there is for free association with the opposite sex, especially under conditions when that sex receives approval. We do not mean to

TABLE 12

PERCENTAGE OF MALES AND OF FEMALES AMONG ALL THOSE NAMED AS PLAYMATES BY THE CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS

DESCRIPTION OF GROUP				SEX OF PLAYMATES NAMED							
Subject		Sibling		Male (per cent)				Female (per cent)			
	Ordinal			AGE DIFFERENCE BETWEEN SUBJECT AND SIBLING IN M.							
Sex	*Position*	*Sex*		*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	
M	2	M	....	73	81	78	77.3	27	19	22	22.7
M	2	F	....	77	62	77	72.0	23	38	23	28.0
F	2	M	....	34	35	31	33.3	66	65	69	66.7
F	2	F	....	38	25	31	31.3	63	75	69	69.0
M	1	M	....	79	77	79	78.3	21	23	21	21.7
M	1	F	....	53	68	74	65.0	47	32	26	35.0
F	1	M	....	42	53	34	43.0	58	47	66	57.0
F	1	F	....	24	31	26	27.0	76	69	74	73.0
M	2	M or F	....	75.0	71.5	77.5	74.7	25.0	28.5	22.5	25.3
F	2	M or F	....	36.0	30.0	31.0	32.3	64.5	70.0	69.0	67.8
M	1	M or F	....	66.0	72.5	76.5	71.7	34.0	27.5	23.5	28.3
F	1	M or F	....	33.0	42.0	30.0	35.0	67.0	58.0	70.0	65.0
M or F	2	M	....	53.5	58.0	54.5	55.3	46.5	42.0	45.5	44.7
M or F	2	F	....	57.5	43.5	54.0	51.7	43.0	56.5	46.0	48.5
M or F	1	M	....	60.5	65.0	56.5	60.7	39.5	35.0	43.5	39.3
M or F	1	F	....	38.5	49.5	50.0	46.0	61.5	50.5	50.0	54.0
M	1 or 2	M	....	76.0	79.0	78.5	77.8	24.0	21.0	21.5	22.2
M	1 or 2	F	....	65.0	65.0	75.5	68.5	35.0	35.0	24.5	31.5
F	1 or 2	M	....	38.0	44.0	32.5	38.2	62.0	56.0	67.5	61.8
F	1 or 2	F	....	31.0	28.0	28.5	29.2	69.5	72.0	71.5	71.0
M	1 or 2	M or F	....	70.5	72.0	77.0	73.2	29.5	28.0	23.0	26.8
F	1 or 2	M or F	....	34.5	36.0	30.5	33.7	65.8	64.0	69.5	66.4
M or F	1 or 2	M	....	57.0	61.5	55.5	58.0	43.0	38.5	44.5	42.0
M or F	1 or 2	F	....	48.0	46.5	52.0	48.8	52.2	53.5	48.0	51.2
M or F	2	M or F	....	55.5	50.8	54.2	53.5	44.8	49.2	45.8	46.6
M or F	1	M or F	....	49.5	57.2	53.2	53.3	50.5	42.8	46.8	46.7
M or F	1 or 2	M or F	....	52.5	54.0	53.7	53.4	47.6	46.0	46.3	46.6

Significant Differences	*p*
Per Cent of Playmates Who Were Male	
Child's sex	< .01
Per Cent of Playmates Who Were Female	
Child's sex	< .01

imply, however, that we should expect conflict to be completely dissipated. Congruent with the previous point is the fact that children who had a sib of the opposite sex and near in age tended with a higher incidence to express a preference for playmates opposite in sex to themselves and more often named such as best friend, than did children from same-sex pairs (Tables 11, 13). The incidence of preference for male playmates, then, tended to be greater in the groups where the sib was male than when the sib was female, and, conversely, though the difference, while consistent, was not quite great enough to meet the statistical criterion of significance, the frequency of preference for female playmates was greater in mixed-sex pairs than in same-sex (Table 11). (*See also* Reference 7.) The difference between first-born boys with a sister and first-born boys with a brother was marked, as was also the difference between second-born girls with a brother, as compared with second-born girls with a sister (*see also* Reference 7).

It is noteworthy, relevant to the sex identification question, that the expressed preference for playmates of their own sex (not the number of associates or even preferred playmates) was more frequent among those children whose sib differed over two years in age than for those whose sib differed by under two years (Table 11). (*See also* Reference 7.) A parallel trend was observed in the case of best friend (Table 13). There was a marked drop in frequency of reported indifference as to sex of playmate from the close to the middle spacing (Table 11), a finding not out of line with those in Reference 7. The association with the sib and his associates, as was shown earlier, is greater when the latter is near in age (Table 5) and much of the association occurs on home territory. This may temper inter-sex rivalry. When the child, on the other hand, because of a large age disparity between himself and his sib, must seek, or wishes companions of his own—i.e., must choose them—his inclination seems to be for associates of his own sex type.

It is of possible significance in connection with the question of cultural or social pressures that boys tended to have proportionally more boy companions than girls had girls (Table 12). Pointing in the same direction is the fact that the girl's best friend was less frequently female than the boy's best friend was male (Table 13), a finding quite in line with Rabban's result and our results presented in (7). A variety of possible interpretations occur to us. It may be the boy's play is more varied and interesting. It is not impossible that the girl has sensed the favored status which the society in which she lives gives to the male and more frequently tries to associate with him than he does with her. This seems not very likely, as the girl's expressed preference is quite as strong for her sex as the boy's expressed preference is for his. Possibly, parents seek male companions for their sons more frequently than female companions for their daughters. There is evidence that it is more serious in our culture for the boy to deviate from the male type than for the young girl to deviate from the female type.

TABLE 13

PERCENTAGE OF MALES AND OF FEMALES AMONG THOSE NAMED AS "BEST FRIEND" BY THE CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS

DESCRIPTION OF GROUP				SEX OF "BEST FRIEND"							
Subject		Sibling		Male (per cent)				Female (per cent)			
	Ordinal			AGE DIFFERENCE BETWEEN SUBJECT AND SIBLING IN MONTHS							
Sex	*Position*	*Sex*		*7-24*	*25-48*	*49-72*	*Total*	*7-24*	*25-48*	*49-72*	*Total*
M	2	M	....	80	93	93	88.7	20	7	7	11.3
M	2	F	....	60	73	80	71.0	40	27	20	29.0
F	2	M	....	27	40	40	35.7	73	60	60	64.3
F	2	F	....	40	27	13	26.7	60	73	87	73.3
M	1	M	....	100	93	67	86.7	0	7	33	13.3
M	1	F	....	73	71	73	72.3	27	29	27	27.7
F	1	M	....	33	13	47	31.0	67	87	53	69.0
F	1	F	....	21	40	33	31.3	78	60	67	68.3
M	2	M or F	....	70.0	83.0	86.5	79.8	30.0	17.0	13.5	20.2
F	2	M or F	....	33.5	33.5	26.5	31.2	66.5	66.5	73.5	68.8
M	1	M or F	....	86.5	82.0	70.0	79.5	13.5	18.0	30.0	20.5
F	1	M or F	....	27.0	26.5	40.0	31.2	72.5	73.5	60.0	68.7
M or F	2	M	....	53.5	66.5	66.5	62.2	46.5	33.5	33.5	37.8
M or F	2	F	....	50.0	50.0	46.5	48.8	50.0	50.0	53.5	51.2
M or F	1	M	....	66.5	53.0	57.0	58.8	33.5	47.0	43.0	41.2
M or F	1	F	....	47.0	55.5	53.0	51.8	52.5	44.5	47.0	48.0
M	1 or 2	M	....	90.0	93.0	80.0	87.7	10.0	7.0	20.0	12.3
M	1 or 2	F	....	66.5	72.0	76.5	71.7	33.5	28.0	23.5	28.3
F	1 or 2	M	....	30.0	26.5	43.5	33.3	70.0	73.5	56.5	66.7
F	1 or 2	F	....	30.5	33.5	23.0	29.0	69.0	66.5	77.0	70.8
M	1 or 2	M or F	....	78.2	82.5	78.2	79.6	21.8	17.5	21.8	20.4
F	1 or 2	M or F	....	30.2	30.0	33.2	31.1	69.5	70.0	66.8	68.8
M or F	1 or 2	M	....	60.0	59.8	61.8	60.5	40.0	40.2	38.2	39.5
M or F	1 or 2	F	....	48.5	52.8	49.8	50.4	51.2	47.2	50.2	49.5
M or F	2	M or F	....	51.8	58.2	56.5	55.5	48.2	41.8	43.5	44.5
M or F	1	M or F	....	56.8	54.3	55.0	55.4	43.0	45.8	45.0	44.6
M or F	1 or 2	M or F	....	54.3	56.2	55.8	55.4	45.6	43.8	44.2	44.5

Significant Differences	*p*
Best Friend Male	
Child's sex	$< .01$
Sib's sex	$< .05$
Interaction—child's sex, ordinal position, spacing (7-24) vs. (49-72)	$< .05$
Best Friend Female	
Child's sex	$< .01$
Sib's sex	$< .05$
Interaction—child's sex, ordinal position, spacing (7-24) vs. (49-72)	$< .05$

In other words, a sissy is more frowned upon than is a tomboy (*see* Reference 7). Since a "man is known by the company he keeps," it will be viewed by the culture as important that the boy's companions be predominantly male. It also seems not impossible that the above fact, or more frequent association of girls with boys than vice versa, merely reflects the former's greater exposure to boys than boys to girls. Mothers may be willing to let the latter play at friend's homes more frequently, perhaps, than they are to permit this for their daughters—an early indication of the culture's tendency to give boys more freedom to go about. However, since data we have indicate that girls of five and six have more friends than boys and are socially more mature, it may be it is the girls who are circulating the more socially. It is worth pointing out in this connection a finding, the data supporting which we have not yet published—namely, that the first-born boys affirmed that they played much with their sisters with a higher incidence than the girls asserted that their association with their brothers was very frequent. This, of course, as has been mentioned, may merely reflect a difference in the standards of the two sexes, or that the girls are less rejecting of things masculine than boys are of things feminine (*see* References 12 and 7).

Bearing on the issue of the sex identification problem of the two sexes is the observation that at the middle and wide spacing those first-borns with a female sib alleged more frequently they were indifferent as to sex of playmate than did those with a male (*see also* 7), while among second-borns the trend was reversed (Table 11). The preschool and very young male, we have a hunch, is particularly in conflict relative to his sex, partly because he operates in the home environment, which tends to be female dominated. Rabban's finding of greater awareness of their sex role in preschool boys than girls (12) may also be a reflection of the mechanism suggested. The girl's conflict, on the other hand, we suspect, increases as she expands her contacts outside of the home—i.e., with the environment in which the male tends to receive more favor. The second-borns, then, one would expect to be exposed to more rivalry along sex lines (because of the girl's own stress) if the sib is female than if male, whereas in the case of the first-borns, the situation should be reversed. It should be noted, apropos of this, that, when the sib is male, first-borns show more frequently a male preference than second-borns, whereas, when the sib is female, the frequency of preference for males is, if anything, less in the case of the former than the latter and, also, indifference is slightly greater (Table 11). It is well to remind the reader at this point that the sex distribution of the playmates actually associated with does not follow exactly the sex preference pattern just described.

Following is a summary of the findings relative to the sex of the associates of our subjects, as well as to their sex preference in the matter of playmates. (1) The children listed as playmates, as preferred playmate, and as best friend were more frequently those of the child's own sex than

TABLE 14

PERCENTAGE OF MALES AND OF FEMALES AMONG THOSE NAMED AS PREFERRED PLAYMATE BY THE CHILDREN IN THE VARIOUS FAMILY CONSTELLATION GROUPS

DESCRIPTION OF GROUP				SEX OF PLAYMATE "LIKED BEST"							
Subject		Sibling		Male (per cent)				Female (per cent)			
	Ordinal			AGE DIFFERENCE BETWEEN SUBJECT AND SIBLING IN MONTHS							
Sex	Position	Sex		7-24	25-48	49-72	Total	7-24	25-48	49-72	Total
M	2	M	....	67	80	87	78.0	33	20	13	22.0
M	2	F	....	67	63	80	70.0	33	37	20	30.0
F	2	M	....	07	40	27	24.7	93	60	73	75.3
F	2	F	....	20	13	27	20.0	80	87	73	80.0
M	1	M	....	86	87	73	82.0	14	13	27	18.0
M	1	F	....	60	63	80	67.7	40	37	20	32.3
F	1	M	....	27	40	21	29.3	73	60	79	70.7
F	1	F	....	20	27	13	20.0	80	73	87	80.0
M	2	M or F	....	67.0	71.5	83.5	74.0	33.0	28.5	16.5	26.0
F	2	M or F	....	13.5	26.5	27.0	22.3	86.5	73.5	73.0	77.7
M	1	M or F	....	73.0	75.0	76.5	74.8	27.0	25.0	23.5	25.2
F	1	M or F	....	23.5	33.5	17.0	24.7	76.5	66.5	83.0	75.3
M or F	2	M	....	37.0	60.0	57.0	51.3	63.0	40.0	43.0	48.7
M or F	2	F	....	43.5	38.0	53.5	45.0	56.5	62.0	46.5	55.0
M or F	1	M	....	56.5	63.5	47.0	55.7	43.5	36.5	53.0	44.3
M or F	1	F	....	40.0	45.0	46.5	43.8	60.0	55.0	53.5	56.2
M	1 or 2	M	....	76.5	83.5	80.0	80.0	23.5	16.5	20.0	20.0
M	1 or 2	F	....	63.5	63.0	80.0	68.8	36.5	37.0	20.0	31.2
F	1 or 2	M	....	17.0	40.0	24.0	27.0	83.0	60.0	76.0	73.0
F	1 or 2	F	....	20.0	20.0	20.0	20.0	80.0	80.0	80.0	80.0
M	1 or 2	M or F	....	70.0	73.2	80.0	74.4	30.0	26.8	20.0	25.6
F	1 or 2	M or F	....	18.5	30.0	22.0	23.5	81.5	70.0	78.0	76.5
M or F	1 or 2	M	....	46.8	61.8	52.0	53.5	53.2	38.2	48.0	46.5
M or F	1 or 2	F	....	41.8	41.5	50.0	44.4	58.2	58.5	50.0	55.6
M or F	2	M or F	....	40.2	49.0	55.2	48.1	59.8	51.0	44.8	51.9
M or F	1	M or F	....	48.2	54.2	46.8	49.7	51.8	45.8	53.2	50.3
M or F	1 or 2	M or F	....	44.2	51.6	51.0	48.9	55.8	48.4	49.0	51.1

Significant Differences	*p*
Preferred Playmate Male	
Child's sex	< .01
Preferred Playmate Female	
Child's sex	< .01

opposite in sex. The children also expressed verbally a preference for their own sex kind. (2) In those groups in which the child's sex was different from his sib's, the incidence of children holding a preference for playmates opposite in sex to themselves, or expressing indifference as to sex of playmates, was higher than in those groups in which the sib and child were identical in sex. The preference for male playmates, then, tended to be stronger when the sib was male than when it was female and vice versa. (3) Preference for playmates similar in sex tended to increase as the age difference between the the child and his sib increased. A similar trend was shown in the case of the variable, best friend. (4) Boys listed proportionally more male companions than girls did female ones, though no parallel trend was to be noted in the case of the variable, verbally expressed preference. (5) At the sib-age disparity levels of over two years the first-borns with a female sib alleged more often they were indifferent as to sex of playmate than did those with a male, while among second-borns the trend was reversed. (6) When the sib was male, the incidence of first-borns reporting a male preference was higher than the incidence of such a preference among second-borns; but, when the sib was female, the relative frequency of male preference for first- and second-borns was reversed.

For summaries of the findings of previous sections the reader is referred to pages 186 and 193. At this point let it merely be said that the study amply demonstates that characteristics of the sibling are related to the type of associates a child has as well as to the playmate preferences he develops.

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MASCULINITY-FEMININITY IN RELATION TO ANXIETY AND SOCIAL ACCEPTANCE

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The major importance of achieving the role appropriate to one's sex is continually stressed in writings upon the personality development and adjustment of boys and girls. These writings range all the way from Freud (5), who invoked the concept of identification to explain the development of sex-appropriate behavior, to such writers as Havighurst (7) who have seen this process as one of the major developmental tasks facing the maturing individual.

Although research literature on adjustment in the adult abounds in studies of masculinity-femininity, there has been very little examination of sex-appropriate behavior in childhood as related to adjustment. Because of the general significance of this concept, the writer has attempted to test the occurrence of certain relationships which might be hypothesized to exist between sex-appropriate behavior in children and indices of adjustment.

These hypotheses center around what has become a commonplace observation today, that this is an age of transition for women, a period in which the feminine role lacks clarity. There is considerable evidence for this belief. For example, Erikson (4) states that today's young woman finds it impossible to accept the feminine role model provided by her mother. Rabban (11) found that, at least in the middle class, little girls are slower to accept a feminine role than boys are a masculine one. Tryon (14), in her often quoted study, found that, while popularity in boys is associated with approximately the same traits at ages 12 and 15, in the case of girls there is a marked shift in these years from a pattern of ladylike submissive behavior at the earlier age toward a pattern characterized by daring, leadership, activity, and extraversion. Tuddenham (15), who used Tryon's method with the first five grades, found a regular shift in the traits most valued in girls, this shift being in the general direction of that found in a more marked form by Tryon. Helper (8), in a recent study, found that with a junior high school group social acceptance in boys appeared to be associated with following the role model provided by the father, while, in girls, following the mother's role was not so approved. All of these studies would seem to imply that as youngsters reach the upper elementary grades or beyond, masculinity in boys is more rewarded than

femininity in girls. As Tuddenham (16) suggests, typical masculine traits seem to be increasingly approved with increasing age, while typical feminine traits of docility, neatness, quietness—so much valued in the early grades—become progressively less valued as the youngster approaches adolescence.

On the basis of such studies as those mentioned above, it seems reasonable to predict that sex-appropriate behavior in boys of the upper elementary grades would tend to be associated with a high level of social acceptance while the reverse might well be true of girls. It would also seem in keeping to predict a relationship between sex-appropriate behavior and the amount of anxiety manifested. Here we would expect that sex-appropriate behavior in boys would be associated with low anxiety, while in girls sex-appropriate behavior would tend to accompany a high level of anxiety. This second prediction would follow if rejection by one's peers is associated with anxiety. Thus, it seems logical to expect low anxiety to accompany sex-appropriate behavior in boys since this is a period in which Tuddenham (16) found the typical masculine traits to be highly valued. In girls we also have a period in which the more masculine traits are valued. It would thus seem likely that girls who hold on to the more feminine pattern in the face of a shift in peer evaluation of such femininity will have difficulties. It is possible also that we have here a circular effect. The docility, neatness, and quietness which characterize the feminine girl of Tuddenham's findings may at this age be expressions of anxiety or insecurity. Ullmann's (17) research would suggest that maladjustment in girls is related to such traits. In turn these somewhat dubious virtues lead to rejection by the peer group so that manifest anxiety might be expected to increase.

A problem which must be solved, however, before it is possible to examine such relationships, is that of developing some index of sex-appropriate behavior for use with children. Since pointed out so cogently by Margaret Mead (9), it has been clearly recognized that much of what we call masculine or feminine is culturally determined. On this basis we might argue that the determination of what is masculine or feminine rests with one's social group. Thus, we could contend that an adequate index of sex-appropriate behavior might be obtained by investigating the opinion of one's peers. It is such a line of reasoning which was followed in the present study. The subsequent section on procedure will describe the instrument which was developed.

With the use of this instrument and others to be described, two hypotheses were tested:

Hypothesis 1. In the upper elementary grades, where groups of high and low anxiety are compared as to sex-appropriate behavior, there will be an interaction effect between sex and anxiety. This will be in the direction of an association between low anxiety and high sex-appropriate behavior in boys. In girls the direction will be reversed, high anxiety being associated with high sex-appropriate behavior.

Hypothesis 2. In the upper elementary grades, where groups of high and low social acceptance are compared as to sex-appropriate behavior, there will be an interaction effect between sex and social acceptance. Boys high in social acceptance will tend to be high in sex-appropriate behavior while with girls those high in social acceptance will tend toward a low degree of sex-appropriate behavior.

Procedure

The Masculinity-Femininity Scale

To obtain an index of sex-appropriate behavior, scales were devised separately for boys and girls along the order of that suggested by Cunningham (3) for a social distance scale and subsequently utilized in the Career Patterns Study (12) in another context. Each of these scales consisted of five points with descriptions for each point. For the girls, as an illustration, Scale Point 1 was:

> She is a regular "young lady." She is sweet and neat and dainty. She doesn't like boys' games and sports at all. She is just interested in home and clothes and girls' games and books.

Scale Point 5 for the girls was:

> She is a real tomboy. She wants to wear jeans all the time and likes boys' games and sports. She acts as if she wished she were a boy instead of a girl.

Scale Point 3 for each sex suggested "the usual type" of boy or girl, and the Scale Points 2 and 4 less extreme positions than 1 and 5.

The wording of these items and the descriptive characteristics, as "wears jeans," were developed largely from paragraphs written by a seventh grade class. These youngsters were asked to describe what it meant to call a girl very feminine or very unfeminine instead and to call a boy very masculine or very lacking in masculinity. A list of names of the children in a group to be rated was printed along side the rating scale and thus each child was rated by every other child in his group. As preliminary checking, in which the ratings by boys and girls were examined separately, indicated that the ratings made by the two sexes were highly similar, each child's score was based on a composite of all the children in his classroom. His score was the mean of the ratings assigned by his classmates. The lower score is every case implies the greater degree of sex-appropriate behavior as perceived by one's peers. The youngsters tended to use the upper end of the scale more heavily, as may be seen by the means for the two sexes. For the boys the mean was 2.54 with a standard deviation of .55; the girls' mean was 2.65 with a standard deviation of .67.

The test-retest reliability for this scale after an interval of six weeks was .94 for the girls in the subject group and .86 for the boys. Correlations were run between peer ratings and the composite ratings of the present

teacher and the teacher of the year before for each of the groups. For the girls the correlation coefficient was .66; for the boys it was also .66. This would indicate that the children rate in a fashion not dissimilar to the adults in question.

The Manifest Anxiety Scale

The children's form of the manifest anxiety scale developed by Castenada, McCandless, and Palermo (2) was employed. This scale is basically an adaptation of the Taylor scale (13) for use with children in the upper elementary grades. Incorporated within it is a lie-scale. Where the anxiety scale was used in the analyses, the records of children with lie-scores of 5 or above were discarded. On the anxiety scale, where scores have a theoretical range of 0 to 42, the mean for the present group of boys was 13.9 with a standard deviation of 5.9. For girls the corresponding statistics were 15.4 and 7.5. These means tend to be somewhat smaller than those found by Castenada, who quotes means of 16.6 and 18.5 for boys and girls, respectively, at the sixth grade level.

The Index of Social Acceptance

The instrument used to assess social acceptance was the Who Are They test developed for use in the Community Youth Development Program (1). This variant of the Guess Who or reputation test consists of 15 items, three dealing with leadership, three with practical intelligence, four with withdrawal, and four with aggression; in addition there is an item in which the child is asked to list those he wishes for friends. Illustrations of items for the first four categories follow:

Leadership: Who are the good leaders? They are leaders in several things.
Practical Intelligence: Who are the boys and girls that make good plans?
Aggression: Who are the ones that break rules—rules of the school and rules of games?
Withdrawal: Who are the boys and girls that stay out of games?

Unlimited choice was given to the children in nominating their peers. Scores were obtained separately for each of the five categories. No separations were made of the nominations for each item by boys and girls as preliminary checking did not indicate that boys and girls tended to nominate differently on the items. It was true, however, that girls nominated a greater number of girls and boys a greater number of boys. The score for each child on any index consisted of the total number of mentions he received for a given category. Since there was a slightly smaller number of children in the sixth grade, their scores were multiplied by a constant to render them equivalent to the seventh grade scores. No direct attempt was made to check reliability of this scale. In a repeat, however, of this test after a lapse of eight months—virtually a school year—with the seventh grade group, rank difference correlations were obtained for each of the five categories separately by the sexes. With the single exception of the correla-

tion for aggression in girls, which was .44, these correlations ranged from .65 to .86. With 14 cases for the boys and 17 for the girls, all of these correlations, except the one of .44 for aggression in girls, may be considered as significant at or beyond the 1 per cent level.

A word should probably be inserted here concerning the independence of the five possible scores on the Who Are They test. They are independent in the sense that there is no overlap in the items used to make up the several scores. Some of the intercorrelations, however, tended to be quite high. Rank-difference correlations between the various pairings of the positive acceptance indices, as calculated separately for the sexes, ranged from .53 to .87. Between the two negative indices, aggression and withdrawal, correlations were low, —.22 and .32 for boys and girls, respectively. The measures of positive acceptance, as would be expected, were negatively correlated with the negative acceptance measures, except in the case of aggression in girls, which showed low positive correlations with the three positive acceptance measures. With this exception the correlations ranged from —.20 to —.61. These correlations were based on the total sample of 34 boys and 27 girls. Despite the substantial nature of many of these correlations it was decided to make use of the five scores in the analyses to follow, chiefly for the purpose of having available more than one index of social acceptance and more than one of rejection. Because of their intercorrelations, however, they cannot be thought of as providing independent tests of the hypothesis concerning the relation between masculinity-femininity and sex-appropriate behavior. Such value as they have is largely one of giving some picture of the consistency of the hypothesized relation.

Subjects

Subjects were obtained from the sixth and seventh grades of a laboratory school which draws almost exclusively from a middle class population, chiefly an upper middle one. All children in the two grades were tested, a total of 34 boys and 27 girls. In the analyses of data approximately the top and bottom thirds of the group of boys and girls with respect to the characteristics being examined were used. With the exception of the analysis involving the children's manifest anxiety scale data, where certain scores were discarded because of a lie-score above the cutting point, there were 11 boys in each of the high groups and 11 in each of the low groups for study. There were nine girls in each of the high groups and the same number in the low groups.

The particular grades used in this study were chosen largely because, on the basis of Tryon's (14) and Tuddenham's (16) findings, these groups might be expected to show the interaction effect at a maximum. This is based partly upon the assumption that the present sample of girls, tested in 1955, might be expected to show the shift in social acceptance in relation to sex-appropriate behavior somewhat earlier than Tryon's sample of nearly two decades ago. Youngsters mature physically somewhat sooner today

and there is at least a general belief that there is an accompanying amount of social acceleration.

The children were tested in their classrooms by their teachers, who had been familiarized with the instruments. The same order was followed in both groups and all tests were completed within a period of three days.

Results

In the analyses which follow, the scores on the masculinity-femininity scale were employed as criterion scores, while the Who Are They and anxiety scores were used to constitute groups of high and low degree of the characteristic being examined. This was done because the masculinity-femininity scores tended to have a small variability and to be approximately normal in distribution as well as could be judged by graphic portrayals of the data. The Who Are They scores tended to be markedly skewed in the positive direction.

With the use of a 2×2 factorial design, analyses of variance were run for the anxiety scale and for each of the five categories of the Who Are They data. A summary of these analyses of variance is given in Table 1. The 5 per cent level of significance was used throughout, and where t tests were employed to test differences in means, one-tail tests were used since all predictions were directional in nature.

Table 1

SUMMARY OF THE ANALYSES OF VARIANCE

Major Variable	Variance components for the several analyses			
	Major Variable $df = 1$	*Sex* $df = 1$	*Interaction* $df = 1$	*Within* $df = 36$
Anxiety	2.007* ($F = 7.66$)	.213	.622	.262†
Leadership	.402	.841	3.017* ($F = 7.24$)	.406
Practical Intelligence	.091	.0001	1.437	.410
Friendship	2.411	.001	2.036* ($F = 6.09$)	.334
Aggression	1.018	.033	.976	.367
Withdrawal	.003	.003	4.063* ($F = 12.98$)	.313

* The ratio between each of these variance components and its appropriate error term is significant at or beyond the 5 per cent level.

† In the analysis of the anxiety data the number of degrees of freedom for the within variance component is 32 instead of 36.

In these analyses it should be pointed out that the nature of the masculinity-femininity scale would be expected to lead to extremely small mean squares when the main effect for sex is examined. This would be anticipated since each of these scales is scored for sex-appropriate behavior rather than for masculinity-femininity *per se*. In other words, it would be surprising to find that girls are more like girls than boys are like boys. The *F* ratios for sex, however, were examined by means of the *F* distribution table. The most startling of these mean squares, .0001, when inverted, yields an *F* of 4100. With 36 and 1 degrees of freedom, respectively, an *F* of that magnitude might be expected to occur by chance between 1 and 2.5 per cent of the time.

Where the analyses yielded significant *F* ratios, *t* tests were used to examine the differences in means of the groups. For each of the sets of data Hartley's test of homogeneity of variance (6) was employed. Where the variance was not homogeneous, the variance estimates for the subgroups were employed in the denominators of the *t* tests. The details of these analyses are given in the succeeding paragraphs. Table 2 gives the mean scores for the groups of high and low level for the several analyses. It should be remembered that the lower the score, the more sex-appropriate the perceived behavior.

The first major hypothesis states that there will be an interaction effect with respect to sex-appropriate behavior when groups are constituted by sex and level of anxiety. As may be seen by reference to Table 1, a significant *F* for interaction was not found. Instead there was a significant main effect for anxiety ($F = 7.66$). The critical value of *F* with 1 and 32 degrees of freedom is 4.16 for significance at the 5 per cent level. The direction of the relation is one of high anxiety's being associated with a high level of sex-appropriate behavior.

The second major hypothesis is that there will be an interaction effect between sex and social acceptance when sex-appropriate behavior is used as a criterion. To test this hypothesis, five separate scores from the Who Are They instrument were employed. Three of these, leadership, practical intelligence, and friendship choice, may be viewed as indications of social acceptance, while the other two, aggression and withdrawal, may be seen as indicating non-acceptance. As was pointed out in the initial discussion of this instrument, the five scores tend to be intercorrelated, and thus the five analyses which follow may not be viewed as five independent tests of the hypothesis. They should serve, however, to point out the general consistency—or lack of it— in the relation between social acceptance and sex-appropriate behavior as perceived by one's peers.

In the subsequent analyses, in those cases in which a significant *F* for interaction was found, comparisons were made of the means of high and low groups of boys on the characteristic under examination, of the high and low groups of girls, of the high groups of the two sexes, and of the low groups of the two sexes. These analyses are presented below.

TABLE 2

COMPARISON OF MEANS FOR THE FOUR SUBGROUPS ON THE WHO ARE THEY TEST

Variables on Which Grouping Is Based	*High Boys* $N = 11$	*Low Boys* $N = 11$	*High Girls* $N = 9$	*Low Girls* $N = 9$
Leadership	2.12	2.81	2.96	2.55
Practical Intelligence	2.37	2.80	2.73	2.42
Friendship	2.18	3.08	2.60	2.59
Aggression	2.56	2.53	2.82	2.16
Withdrawal	2.88	2.32	2.22	2.94

Leadership

As indicated in Table 1 a significant F of 7.24 for interaction was found, where the critical value for significance at the 5 per cent level with 1 and 36 degrees of freedom is 4.11. The findings for comparisons of the means are given immediately below. The critical value for the one-tail test of significance where the variance may be assumed to be homogeneous, as it was in this case, is 1.67.

a. High leadership boys were significantly more sex-appropriate in behavior than low leadership boys ($t = 3.16$).
b. There was no significant difference in girls of high and low leadership reputation.
c. High leadership boys were significantly more sex-appropriate in behavior than high leadership girls ($t = 3.53$).
d. There was no significant difference in boys and girls of low leadership reputation.

Practical Intelligence

No significant F ratio was found in this analysis of variance.

Friendship

Here an F of 6.09 was found for interaction. The four comparisons of means follow:

a. High friendship boys were significantly more sex-appropriate in behavior than low friendship boys ($t = 4.01$).
b. There was no significant difference in high and low friendship girls.
c. There was no significant difference in boys and girls of high leadership.
d. Low friendship girls showed significantly more sex-appropriate behavior than low friendship boys ($t = 3.03$).

Aggression

No significant *F* ratio was found in the analysis of the aggression data.

Withdrawal

An *F* of 12.98 was found for the interaction effect in the analysis of the withdrawal data. When comparisons were made of the means, all of the four examined proved to be significant as follows:

a. Low withdrawal boys showed more sex-appropriate behavior than high withdrawal boys ($t = 2.34$).
b. High withdrawal girls showed more sex-appropriate behavior than low withdrawal girls ($t = 2.74$).
c. High withdrawal girls showed more sex-appropriate behavior than high withdrawal boys ($t = 2.62$).
d. Low withdrawal boys showed more sex-appropriate behavior than low withdrawal girls ($t = 2.47$).

In summary of the tests of the second hypothesis, three of the five interaction effects predicted were found to occur at or beyond the level of significance employed in this study. When tests of the significance of differences in the means of the group are examined, it may be seen that the predicted difference occurs more frequently in the boys' data. Of the 12 comparisons of means for the three sets of data where significant *F*'s for interaction were obtained, six are cross-sex comparisons, three are of high and low boys, and three of high and low girls. All three of the boy-boy comparisons were found to be significant, while only one of the girl-girl comparisons was significant.

Discussion

In the interpretation of the results of this study two cautions must be observed. The first of these is the possibility that in assigning ratings on the masculinity-femininity scale the boy and girl raters were responding to stereotypes of masculine and feminine behavior which have relevance to the items on the Who Are They scale. As a check on this the mean number of nominations given for each sex on the five categories was examined. For leadership the means for boys and girls, respectively, were 11.4 and 11.5. For practical intelligence these means were 8.6 and 9.4. For friendship the boys' mean was 4.8 and the girls' 4.6. On withdrawal the means were 7.4 and 8.2 for boys and girls in order. On aggression the mean was 8.6 for boys, 4.1 for girls. Despite the presumed existence in our culture of stereotypes concerning sex differences in leadership and withdrawal tendencies, the means for boys and girls are highly similar. It is only on the aggression dimension that the sexes differed markedly. Although the items on the Who Are They scale that deal with aggression are stated in terms of com-

plaining, breaking rules, and quarreling rather than fisticuffs, it is still hardly surprising that boys should rate higher in view of the general perception in our culture of aggression as a masculine trait. It probably points out that the hypothesis of an interaction effect between sex and aggressive behavior was an unreasonable one in the first place.

A further caution which must be exercised in interpreting the results of this study is the limitation upon the population to which one can generalize. The current group is probably representative of laboratory school populations where these schools draw primarily from the middle class with a heavy weighting of professional occupations. The research of Rabban (11) and Pope (10) would suggest that the same relationships might not necessarily obtain in lower class groups.

Within these limits, certain results do appear as predicted. The first hypothesis is borne out in the case of girls; that is, high anxiety is associated with a high level of sex-appropriate behavior. Since the main effect for anxiety is significant, however, we have high anxiety related to high sex-appropriate behavior in boys as well, contrary to prediction. It is interesting to speculate as to why this should be true of boys. It is possible that striving to maintain a masculine role is for the boy of this age group stressful enough to be associated with manifest anxiety. Or one could argue contrariwise that only the boy who is secure in his masculine role is willing to admit to such unmanly characteristics. Further investigation might provide an answer to this question.

The second hypothesis is borne out in three of the five comparisons to the extent that the analyses of variance revealed significant F ratios for the interaction effects. When the t tests of differences in means are examined, however, what seems to appear is that the predictions for the boys are confirmed; that is, the higher the level of social acceptance, the higher the level of sex-appropriate behavior. With the girls, as referral back to Table 2 will show, the situation seems to be one of withdrawal's being associated with high sex-appropriate behavior, while, on the other indices, there is little difference in the means of the girls high and low on the characteristics under study. In other words, whether the girl is perceived as being sex-appropriate in behavior, for the most part, does not appear to be associated with the amount of social acceptance she receives.

The findings with respect to social acceptance and sex-appropriate behavior were entirely in line with what we might predict from the exhaustive studies of Tryon (14) and Tuddenham (15, 16) upon evaluation of children's personality characteristics by their peers. In the present study it is true that the effect we found of confusion in the girls' role occurs at an earlier age than in Tryon's sample. The different techniques used, the nature of the present sample, and the two decades that have elapsed are all possible causes. There does seem evidence here, however, for the belief that, to the girl approaching adolescence, achieving an appropriate sex role will be accompanied by difficulties arising from the lack of consistency in

the social acceptance which is accorded the feminine and the masculine qualities she is perceived to exhibit. Where the tomboy is as well liked as the "young lady"—and sometimes better—it is difficult indeed to know what role to follow.

But there is another side to the picture, the plight of the boy who does not adhere to the masculine pattern that seems to follow along so clearly with social acceptance. The approved pattern may be much clearer and more consistent than it is for the girl, but it also may be that deviations from this approved pattern are far less tolerated for the boy than they would be in the girl.

Certainly, further research is needed to explore more completely the relationships demonstrated in miniature in the present study. It would be advantageous to make studies both up and down the age scale. Comparisons of other social class groups might reveal material of interest. The general form of masculinity-femininity peer rating which this study has employed would seem to have value as an instrument for use in the search for the significant correlates of sex-appropriate behavior. If the present form holds up with wider applications, it would be of value in tracing down to a younger age some of the relationships which have been found to exist in adult populations.

Summary

Children in a sixth and a seventh grade class were tested on three instruments, the Who Are They reputation test, the children's manifest anxiety scale, and a masculinity-femininity scale devised for the present study. On the basis of the first two instruments children were divided in two sex groups of high and low anxiety, and of high and low social acceptance on the five categories derived from the Who Are They test.

Analyses of variances were performed with a 2×2 factorial design. Subsequently, differences in means of the subgroups were examined by means of t tests where F ratios for interaction proved significant. On this basis children high in anxiety were found to be significantly more sex-appropriate in behavior than children low in anxiety. On the Who Are They instrument, three of the five analyses showed significant interaction effects, effects which had been predicted for all five categories. Further analysis indicated that high social acceptance in boys was associated with a high degree of sex-appropriate behavior as perceived by peers. With girls the result was less clear-cut. In one of the three analyses where significant F's for interaction were found, acceptance was found to be associated with a low level of sex-appropriate behavior; in the other two comparisons differences between means were not significant.

The results are interpreted as indicating a lack of clarity in the expectancies of the girl nearing adolescence as she is faced by the task of achieving an appropriate sex role. Further research is needed to determine whether this effect exists in a broader population and a wider age range.

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DEVELOPMENTAL STUDIES OF PARENT-CHILD RESEMBLANCE IN INTELLIGENCE[1]

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A number of developmental studies have reported that the mental test scores of children under two years have little or no relationship to parental ability as measured by the number of years of schooling, ratings of intelligence, or test scores (1, 2, 6). When these same children are retested at later ages, their mental test scores are found to be significantly correlated with parental ability. A crucial question is the extent to which these age changes in relationship are due to environmental factors, or to intrinsic differences in the patterns of mental growth. One way in which this increasing resemblance can be evaluated is by comparing the age changes in the correlations which occur among children reared by their own parents in contrast to those reared apart from their parents.

In this report we shall compare the age changes in relationship for two distinct groups, each of over 100 children, who were tested at various ages between 21 months and 16 years; and then contrast this trend with that reported by Skodak and Skeels for 100 adopted children who were tested four times between their second and fourteenth year (6).

In the Guidance Study at the University of California Institute of Child Welfare, a sample of 252 children who were representative of those born in Berkeley during an 18-month period were divided into equivalent subsamples called the "Guidance" and "Control" groups. This division of the main sample was made on the basis of certain socioeconomic variables before the mental testing program was begun (5). The children in the two groups were first brought to the Institute for mental tests at the age of 21 months. The tests used at this age level and at the subsequent testings during the preschool years were the California Preschool Schedules (*see*

[1] Acknowledgment is due Harold E. Jones and John P. McKee for their helpful suggestions and to the U.S. Public Health Service for clerical and statistical assistance.

Table 1). Beginning at six years, the 1916 Stanford Revision of the Binet Scale was the test used, with a shift to the 1937 Revision at age eight. The parents were not given intelligence tests but the number of years of schooling is known for both parents. In addition, in the Guidance group, ratings (on a seven-point scale) of the mothers' intelligence were made when the children were between 3½ and 4½ years by staff members who had had

TABLE 1

CORRELATIONS OF THE CHILDREN'S MENTAL TEST SCORES WITH THE MOTHERS' EDUCATION AND RATINGS OF HER INTELLIGENCE

G = Guidance Group C = Control Group

Age in Years	*Mental Test Given Children*	*Number of Cases*			Relation of the Children's Mental Test Scores × *Mother's Education*			*Ratings of Mother's Intelligence*
		G	C	G+C	G	C	G+C	G
					r	*r*	*r*	*r*
1¾	Calif. Preschool	117	117	234	.13	00	.06	.11
2	Calif. Preschool	113	...	113	.07	..	.07	.08
2½	Calif. Preschool	114	...	114	.10	..	.10	.06
3	Calif. Preschool	116	113	229	.10	.08	.09	.17
3½	Calif. Preschool	107	108	215	.27**	.25**	.26**	.39**
4	Calif. Preschool	105	106	211	.22*	.25**	.23**	.38**
5	Calif. Preschool	104	106	210	.45**	.25**	.35**	.53**
6	Stanf.-Binet (1916 Rev.)	109	102	211	.27**	.37**	.32**	.40**
7	Stanf.-Binet (1916 Rev.)	104	104	208	.35**	.33**	.33**	.51**
8	Stanf., Form L	100	98	198	.34**	.32**	.33**	.54**
10	Stanf., Form L or M ..	105	92	197	.33**	.34**	.34**	.52**
12 or 13	Stanf., Form L or M ..	98	94	192	.38**	.38**	.38**	.54**
14 or 15	Stanf., Form L or M ..	90	78	168	.39**	.30**	.35**	.59**

* Significant at the 5 per cent level.
** Significant at the 1 per cent level.

many hours of discussion with the mothers.[2] The correlation between these ratings of the mothers' intelligence and the number of years of schooling of the mothers is +.73. In fact, in this study all measures which reflect the ability of the parents were intercorrelated to about the same extent (socioeconomic status correlates with both mothers' and fathers' schooling +.73; mothers' and fathers' schooling correlate +.74). The

[2] Ratings used were an average of these ratings made independently for each mother by a psychiatric social worker and Dr. Jean W. Macfarlane, Director of the Guidance Study. The ratings were made without reference to the mental test scores of the children who were tested on the then new California Preschool Scales. These scales were scored in final form several years after the parental ratings were assigned.

relationship between these indices of parental ability and the children's mental test scores was reported earlier for the age period 21 months to eight years (2).

The correlation between the education of the mothers and the children's mental test scores at 21 months was negligible but between 3 and 3½ years, the relationship became significant (*see* Table 1). To check the

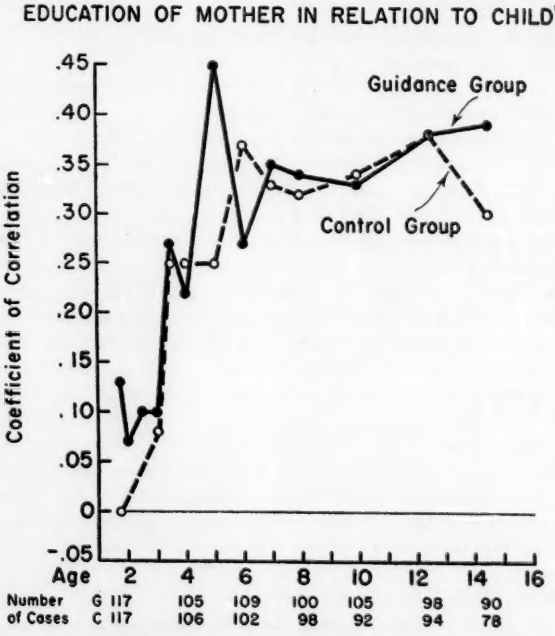

FIGURE 1—Education of mother in relation to child's IQ.

validity of this age trend, correlations were computed separately for the two subsamples of the total Guidance Study sample. The results of this comparison are shown in Table 1 and Figure 1. The finding that these subsamples exhibit essentially the same age changes in relationship suggests that the trend is a valid one and would be duplicated in comparable developmental studies; in fact, Bayley (1) has reported a similar trend in the Berkeley Growth Study.

In a study of 100 adopted children, Skodak and Skeels report that adopted children whose true mothers tested quite low in intelligence earned mental test scores which were substantially higher than those of their mothers (6). In addition, these authors report the relation of various

indices of ability of the true mothers to the mental test scores of their children at four successive age levels. It is these correlations which interest us and which we wish to compare with the relationships obtained in the Guidance Study for children reared by their own mothers.

Regardless of the index used (IQ or number of years of schooling), Skodak and Skeels found that the correlation between the *true* mother's ability and her child's mental test scores at approximately two years of age is insignificant. By the time the adopted children reached four years on the average, the correlations between their IQs and the true mothers' education and intelligence are +.31 and +.28, respectively. These correlations are significant at the 5 per cent level. In contrast these authors found *no* relationship at any age between the mental test scores of these same children, who were adopted in the first months of life, and their *foster*, or adopting, mothers' education. These highly significant results are especially interesting when compared with the findings for the groups of children who have always lived with their own parents (1, 2).

In Figure 2, the mother-child correlations for the total Guidance Study sample (combined Guidance and Control groups) are compared with those reported by Skodak and Skeels for the adopted children. It will be noted that the true mother-child correlational age trends in their study and ours are as alike as those shown in Figure 1 for the two subsamples of our group. The similarity in the changing relationships with age for the Guidance Study group who always lived with their parents as compared with the Skodak-Skeels group who never lived with their parents is impressive. However, the final correlations between the index of maternal ability (number of years of schooling) and the children's mental test scores is only +.35 for the children reared by their true parents; and +.32 for the children not reared by their true parents, indicating that less than 15 percent of the variance in the children's scores can be accounted for by this very rough index of the true mother's ability.

The fact that the individual differences in the adopted children's mental test scores are not related to the foster mothers' education at any age is also shown in Figure 2. This finding is surprising since the average IQ of the adopted children at 13½ years was 106, while the average IQ of their true mothers was reported as only 86. A regression upward toward the mean is to be expected but not beyond the mean. Our interpretation of these findings is that the educational level of the true mother roughly indicates her intellectual capacity and this capacity is at least somewhat determined by genetic factors which she, in turn, transmits to her children. The difference in the level of ability of the adopted children and their true mothers may be due in part to systematic undermeasurement of the true mothers' intelligence and in part to the generally favorable environment provided by the foster families. It is conceivable, and it seems to us probable, that in this sample certain unmeasured family variables such as the affection and emotional support given the foster children were as important as

purely intellectual stimulation in nurturing the mental growth and performance of these foster children.[3]

A better indication of the age changes in the mother-child resemblance would probably have been obtained if optimal test scores had been available for the mothers in these two studies. In the Skodak-Skeels investigation, 63 of the mothers were given individual mental tests but these mothers

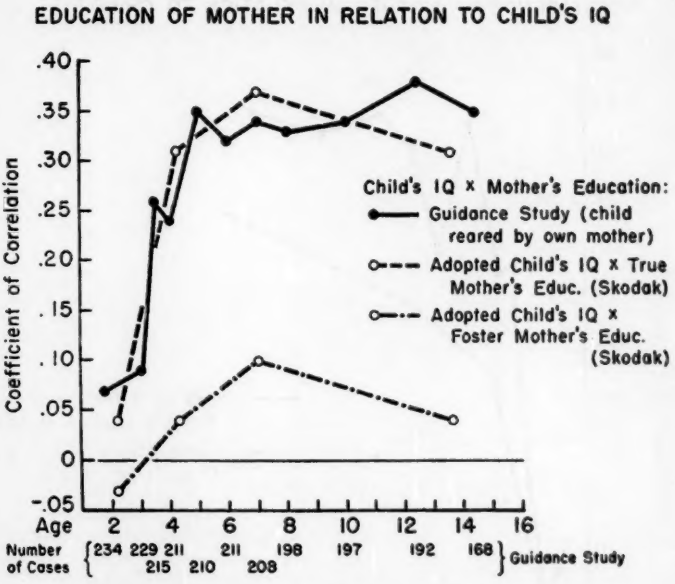

FIGURE 2—Education of mother in relation to child's IQ.

were tested shortly after the babies' births "usually after the mother had decided to release the baby for adoption." The authors note that "these IQs were consistent with other evidence of the mental adequacy of the mothers" and the "tests were never given when the mother was ill or obviously upset," but it is unlikely that these IQs reflect the optimum performance of which these mothers might have been capable under more favorable conditions. However, even these IQs showed age trends in relationship to the mental test scores of the children which were similar but tended to run a little higher than those obtained for the mothers' education.

[3] The importance of various non-intellectual environmental factors to the mental test scores of the children in the Guidance Study will be presented later in a report entitled "Mental Growth in Relation to Intellective and Non-Intellective Parental Variables."

The mother-child correlations in the Guidance Study are higher when based on ratings of the mother's intelligence than when education is used as an index of the mother's ability (Table 1). They are, in the former instance, comparable with the correlation of .49 reported by Jones in a study in which testing procedures for both parents and children were carefully controlled (4).

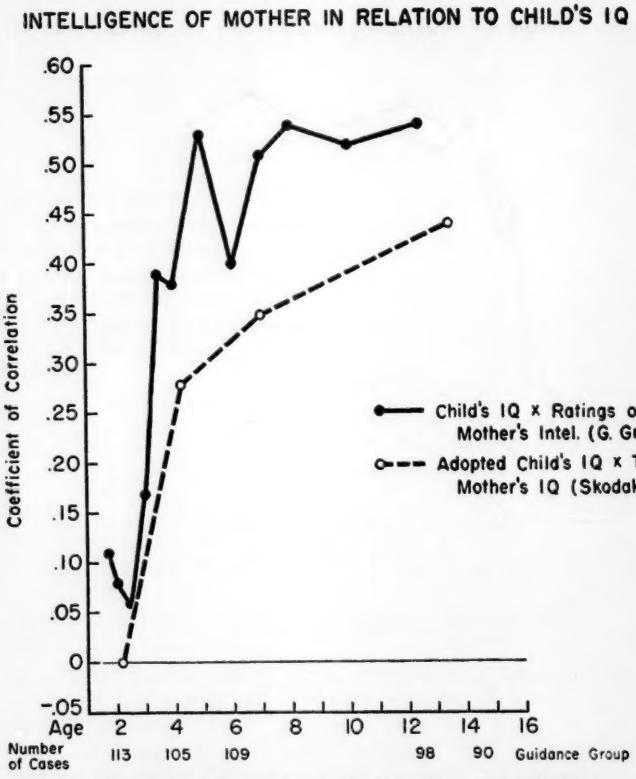

FIGURE 3—Intelligence of mother in relation to child's IQ.

In Figure 3, the age change in mother-child resemblance in intelligence reported by Skodak and Skeels for 63 of the adopted children is compared with the findings for the Guidance group where the measure of maternal intelligence was an averaged rating. The correlations obtained in the Guidance group are higher than those reported for the adopted children. This latter difference may be due to differential environmental stimulation

by the more intelligent mothers in the Guidance group but there is also the likelihood in the Skodak-Skeels study of an unequal effect of stress on the mothers' IQs. These findings certainly suggest that the variations in the magnitude of the correlations depend somewhat on the sensitivity of the measures of maternal intelligence, but the question of whether the differences in the correlations shown in Figure 3 are entirely attributable to differences in the validity of the measures of mothers' intelligence cannot be answered by these studies.

TABLE 2

CORRELATIONS OF THE CHILDREN'S MENTAL TEST SCORES WITH THE FATHERS' EDUCATION

G = Guidance Group C = Control Group

Age in Years	*Mental Test Given Children*	*Number of Cases*			*Relation of the Childrens' Mental Test Scores to the Father's Education*		
		G	C	G+C	G	C	G+C
					r	*r*	*r*
1¾	Calif. Preschool	117	117	234	.10	.06	.07
2	Calif. Preschool	113	...	113	—.05	..	—.05
2½	Calif. Preschool	114	...	114	.03	..	.03
3	Calif. Preschool	116	113	229	.01	.19	.11
3½	Calif. Preschool	107	108	215	.17	.25**	.21**
4	Calif. Preschool	105	106	211	.17	.30**	.24**
5	Calif. Preschool	104	104	208	.40**	.19*	.29**
6	Stanf.-Binet (1916 Rev.) ..	109	102	211	.24*	.36**	.30**
7	Stanf.-Binet (1916 Rev.) ..	104	104	208	.37**	.43**	.40**
8	Stanf., Form L	100	98	198	.37**	.34**	.35**
10	Stanf., Form L or M	105	92	197	.36**	.32**	.34**
12 or 13	Stanf., Form L or M	99	94	193	.45**	.33**	.39**
14 or 15	Stanf., Form L or M	90	78	168	.48**	.26*	.37**

* Significant at the 5 per cent level.
** Significant at the 1 per cent level.

The correlations between the number of years of schooling of the father and the children's mental test scores at successive ages are reported for the Guidance and Control groups separately and combined in Table 2. Although there are a few coefficients in this table which appear too high or too low in relation to the trend (e.g., the correlations of +.40 at five years for the Guidance group and +.43 for the Control group at seven years), the age changes are similar to those found between the mental test scores of these children and the mothers' education. The relationship between the number of years of schooling of the father and the children's test scores is negligible at 21 months (+.07) and 3 years (+.11) but is

significant at the 5 per cent level at 3½ years (+.21) and reaches a high of +.40 at 7 years, thereafter ranging from +.34 to +.39. The trend of the age changes in relationship between the children's mental test scores and the fathers' schooling is similar in the two groups (Guidance and Control) in spite of the above mentioned inconsistencies. In Figure 4, the correlations for these two groups combined are compared with the findings for adopted children in relation to the education of their true fathers. The correlations

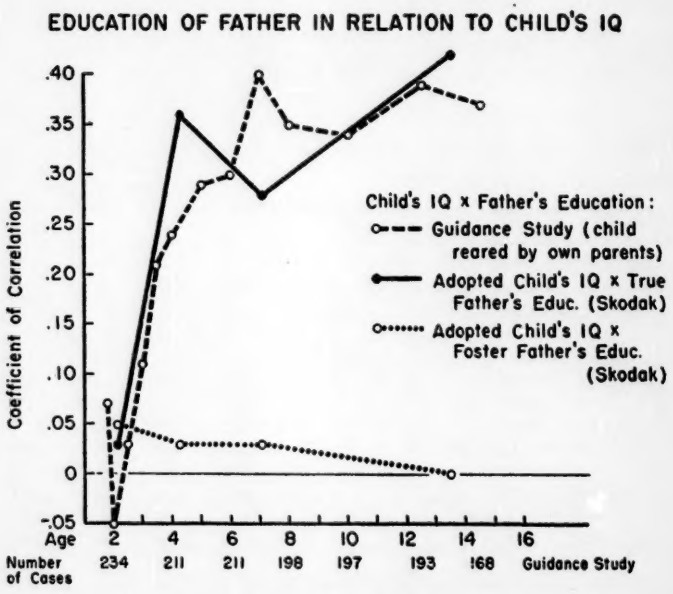

FIGURE 4—Education of father in relation to child's IQ.

between the mental test scores of the adopted children and the education of their true fathers were computed from the raw data presented by Skodak and Skeels (*see* Table 3). The impressive fact shown by Figure 4 is that the trend in relationships for the adopted children resembles so closely that found for the children reared by their own parents. Since the relationships obtained in the Guidance Study are no higher than those found for the adopted children, we may infer that the more highly educated fathers do not offer differentially more stimulating environments to their children. This inference is confirmed by the findings for the foster fathers shown in Table 3.

TABLE 3

CORRELATIONS BETWEEN THE CHILDREN'S MENTAL TEST SCORES AND THE FATHERS' EDUCATION (SKODAK-SKEELS)

Average Age of Adopted Children in Years	*Mental Test Given Children*	*True Father's Education × Child's IQ N = 60*	*Foster Father's Education × Child's IQ N = 100*
		*r**	*r*
2-2	Kuhlman or 1916 Stanford-Binet	+.03	+.05
4-3	Stanford-Binet (1916 Rev.)	+.36**	+.03
7-1	Stanford-Binet (1916 Rev.)	+.28**	+.03
13-6	Stanford, 1937 Revision	+.42**	+.00

* These correlations were computed from the original data published by Skodak and Skeels (6).

** Significant at the 1 per cent level.

INDIVIDUAL MENTAL GROWTH RECORDS

The mental growth patterns for individual children have been considered in relation to the parental ability. The method used was to convert both the children's mental test scores and the average of the number of years of schooling of the parents into standard scores, and then note the age level at which the child's mental test SD score reaches the parental SD score with respect to educational level. Using this technique, Bayley presents three cases from the Berkeley Growth Study in which the mental test SD scores of the children reaches the parents' relative educational level at ages 4, 8, and 16 years, respectively, after a period of scoring above or below the parental status (1). Inspection of individual mental growth records in the Guidance Study also suggests that there are marked differences in the ages at which the children's scores reached the parental level of ability, as indicated by their education. Twelve cases are shown in Figures 5, 6, 7.

In Figure 5, the mental test scores of four children of highly educated parents are shown. These children begin to resemble their parents in ability at ages 2½, 4, 8, and 18 years, as judged by the comparison of the standard mental test scores of the children and a standard score based on the averaged years of education of the two parents.

Figure 6 shows the low or decreasing IQs of children of parents of average or less than average education. Here again, the children vary with respect to the age at which their mental scores are comparable with the educational level of their parents.

In Figure 7, the scores of four children whose IQs fluctuate markedly may be seen in relation to their parents' education level. At certain ages,

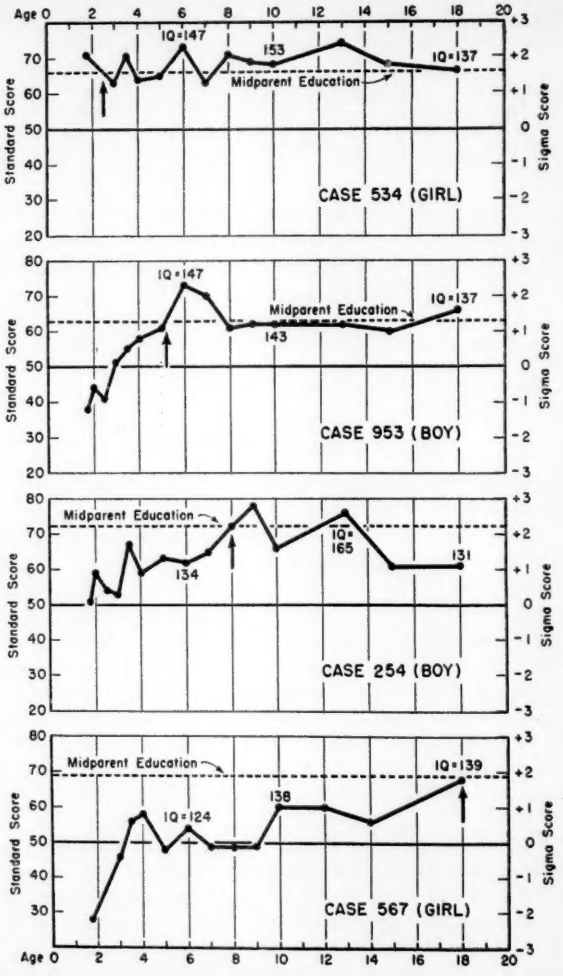

FIGURE 5—High or increasing IQs of children of highly educated parents.

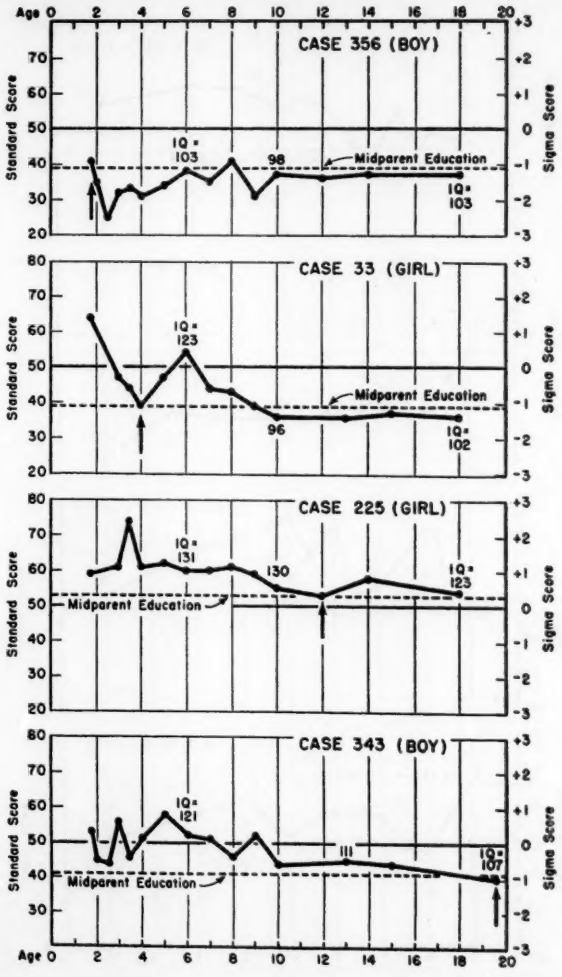

FIGURE 6—Low or decreasing IQs of children of parents of average or little education.

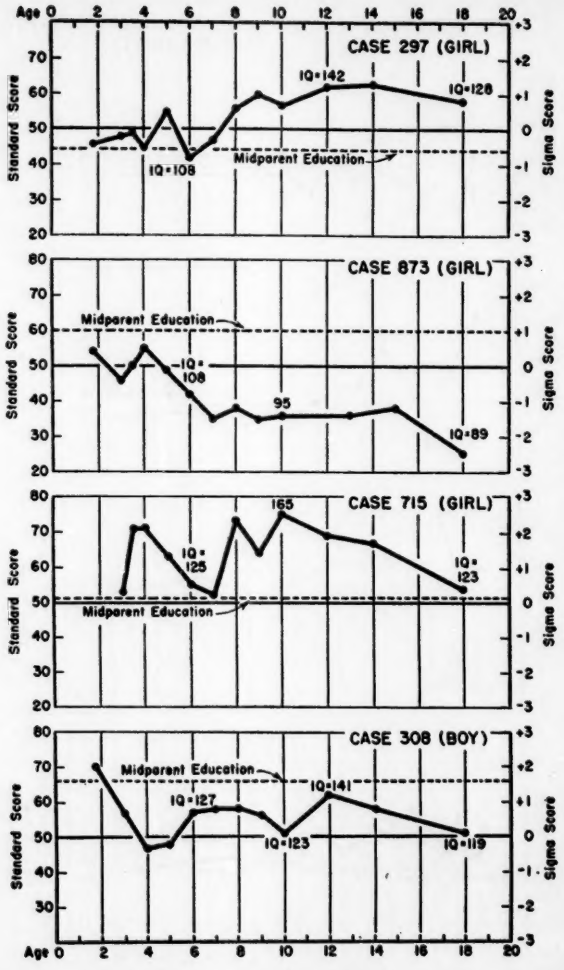

FIGURE 7—Children whose IQs vary in relation to parental education.

the IQs of these children reach a status which is comparable with that of their parents and then deviate to a position which is substantially above or below that of the parents. Case 873 is an unusually shy, inhibited girl who was so withdrawn that she did not want to go to school. The mother of this girl said that she was less precocious than her other children so perhaps this decreasing IQ may be accounted for in part by emotional factors and in part by the fact that she has less capacity than would be expected in this family. Consideration of these cases suggests the great individuality in patterns of mental growth and that, although the trend is toward an increasing resemblance between parents and children, the patterning varies markedly.

Summary and Conclusions

The increasing parent-child resemblance in mental ability found for two groups of children reared by their own parents has been compared and found to be similar to that reported for a group of children reared from early infancy by foster parents (6). The ability measures used in both studies were, for the children, individually administered intelligence tests, and for the parents, the number of years of schooling; and additionally for the mother, test scores and ratings. The finding that the parent-child resemblance in ability follows the same age changes in the two studies, even though the true parents did not rear the children in the Skodak-Skeels group, suggests that the existing relationship is largely due to genetic factors which tend to become manifest in the child during the later preschool years. Although the group age trends in relationship for both the adopted and non-adopted children are similar, the extent of the relationship is of low predictive value. There were wide individual differences in the ages at which children achieved mental test standard scores which were comparable with their parents' standard scores.

The fact that the parent-child resemblance is no greater for children reared by their own parents and the further fact reported by Skodak-Skeels of no relationship between the children's mental test performance and the foster parents' ability suggest that the education of the parents per se is not an environmentally important factor and that the obtained parent-child correlations reflect individual differences which are largely genetically determined.

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FREQUENCY OF REGURGITATION IN INFANCY AS RELATED TO THE AMOUNT OF STIMULATION RECEIVED FROM THE MOTHER[1]

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The psychological importance of gastro-intestinal disturbances in the infant has been stressed by Ribble (7), Sullivan (10), Escalona (1), Montague (4), Sontag (8, 9), and Laybourne (3). Of these, perhaps Ribble (7) has given the most precise statement of the problem and of the mechanism involved: She states that, ". . . the gastro-intestinal functions are easily disturbed as is shown by the frequency of regurgitation, hiccoughs, and diarrhea" (p. 630) and that these disorders may arise from "inadequate 'mothering' " (p. 633), emotional disturbance in the mother and a disturbance of "mothering" activities (p. 633). The "mothering" activities such as handling, fondling and rocking she has termed "stimulus feeding" (p. 632) and she maintains that such stimulation over a prolonged period results in improved digestion (p. 631). While the evidence she presents in support of this hypothesis has been critically evaluated by several writers (5, 6), they present no experimental test of the hypothesis. The notion, that a decrease in gastro-intestinal disorder as shown in reduced frequency of regurgitation, will result from an increase in stimulation of the infant by the mother is the problem investigated in this study.

SUBJECTS AND PROCEDURE

In order to obtain subjects for the study, letters explaining something of its nature were sent to the parents of 400 infants born in the Eugene-Springfield-Coburg area of Oregon between November 15, 1953, and

[1] The data analyzed in this study were collected while the investigators were at the University of Oregon. A first report on the results was presented at the thirty-fourth meeting of the Western Psychological Association (2).

[2] At the time of the final analysis of the data the second author was a U.S. Public Health Service Research Fellow of the National Institute of Mental Health.

January 30, 1954. Eighty-eight parents responded favorably and returned an enclosed questionnaire. The 55 of those reporting some amount of regurgitation were selected as subjects. Of these, 46 completed four weeks of observation and 38 completed the five weeks of the study.

The mothers of the infants selected for the study were interviewed with regard to certain child rearing and feeding practices, the behavioral and gastro-intestinal reactions of the child, and the educational status of the parents. They were told that this was a pilot study to determine the frequency of various gastro-intestinal reactions of the child, which it was hoped would lead to a more intensive investigation of the causes of such reactions, and that it was also directed at obtaining further information about the development of the child's vocalizations. They were given a small spiral pad with a pencil attached and instructed to record the incidence of burps, regurgitations and feedings, and the occurrence of new vocalizations. (Regurgitation was defined as the spitting up of any amount of food once it had been swallowed.) The importance of recording these events as they took place was emphasized. Either following the interview or within the next few days MMPI's were administered to the mothers. (The analysis of these data will be presented in a later paper.)

The infants were randomly assigned to either an experimental group or to a control group during the second week of the study. The mothers of the experimental subjects were told that the investigators wished to test the hypothesis suggested by some writers that close contact with the infant and stimulation of the infant by the mother would both increase the child's vocal activity and advance his speech development. They were requested to increase their stimulation of the child before each feeding for at least 10 minutes more than they had indicated in the original interview, or at least 10 minutes more than their current practice (whichever was greater). It was stressed that this should supplement, not replace, other attention received by the child. The investigators explained that increased stimulation meant handling, rocking, swinging, rolling on the bed, fondling, tickling, bouncing, etc., anything which would "let the child know" that the mother was directing attention to him, and that this "stimulus feeding" should be done by the mother herself. A two-week period of increased stimulation was followed by a return to "normal" handling.

Since the incidence of regurgitation may decrease with age during the first year, it was necessary to match experimental and control subjects on the basis of age. It proved possible to obtain 21 pairs, i.e., 21 controls on whom records were available for essentially the same age interval as for 21 individuals in the experimental group. In 17 pairs the age mates were within three days of age. In the remaining four pairs, they were within two weeks of the same age.

The parents of the subjects represent a superior group both educationally and socioeconomically. Except in the case of six of the families,

one or both parents had some college experience, all except one of the families had a telephone, and the majority had their own automobiles and were buying their own homes.

TABLE 1

WEEKLY INTERCORRELATIONS OF FREQUENCY OF REGURGITATION

	Week 1	Week 2	Week 3	Week 4	Week 5
A. Control Group					
Week 1		.98			.78
Week 2			.82		
Week 3				.90	
Week 4					.92
B. Experimental Group					
Week 1		.98			.86
Week 2			.92		
Week 3				.96	
Week 4					.93

RESULTS

Consistency

In order to determine the consistency of regurgitation as recorded by the mothers during the five-week period of observation, the correlations between frequencies of regurgitation for adjacent weeks were calculated. These relationships, given separately for the control and experimental groups in Table 1, indicate that from week to week there was a high degree of consistency of the individual relative to the group. The relationships between the frequencies recorded in the first and fifth weeks, also included in Table 1, suggest a strong tendency for the individual to maintain his same relative position on this variable during the period of early infancy.

The relationships reported above are based on subjects who differ in age by as much as three months. Inasmuch as regurgitation probably decreases with age the question arises as to whether the high consistency coefficients obtained are a partial function of the heterogeneity of the samples with respect to age. In order to determine whether or not this was the case, a consistency coefficient was determined for those 22 infants who were in the study between the ages of 99 and 113 days, the age interval which included the largest number of subjects. The obtained correlation

between the first and second weeks of this period was .94. The consistency was also determined for those of this group who remained in the study until 120 days of age. For 17 infants the correlation was .98 between the first and third weeks of this period and .95 for the second and third weeks. For comparable time intervals, these correlations are not significantly different from those presented in Table 1. As a final check, the incidence of regurgitation for these subjects for the age period of 99–106 days was correlated with the frequency of regurgitation recorded during the first week of the experimental period. The obtained correlation was .92. In the light of these results there would appear to be no basis for believing that heterogeneity with respect to age materially affected the consistencies reported above.

A problem of perhaps as much importance as the consistency of recorded observation is the agreement of "casually noted" frequency and objectively recorded frequency; in other words, assuming the accuracy of the record, what is the veracity of "anecdotal" reports as given in the mail-in questionnaire. The correlation between frequency *recorded* during the first week of the investigation and the frequency *reported* on the mail-in questionnaire was .82. A comparison of this value with those obtained in Table 1 suggests that at least in some areas mothers are able to report fairly accurately their children's behavior. However, the possibility must

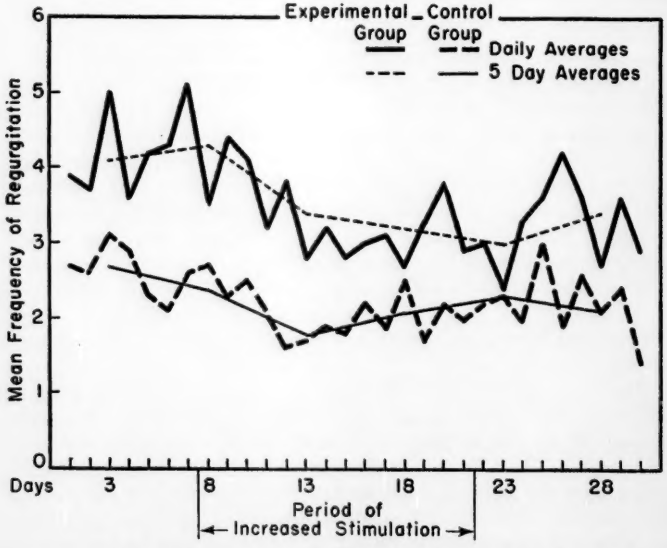

FIGURE 1—Frequency of regurgitation during the period of the study.

be recognized that this relationship could be spuriously high. Although it seems unlikely, the mother's recall of her answers in the initial questionnaire and interview conceivably could have biased her subsequent tally of the events. (In the absence of an additional observer the accuracy is indeterminable for both the mother's report in the interview and her daily record of incidence of regurgitation.)

A reduction in frequency of regurgitation during infancy is supported by casual observation. Such a reduction is evident in both the experimental and control groups as shown in Figure 1 where the averages for five-day intervals are superimposed on the daily averages. The mean change in frequency of regurgitation for the total group was determined between the first and third weeks, the period of most rapid change; the mean

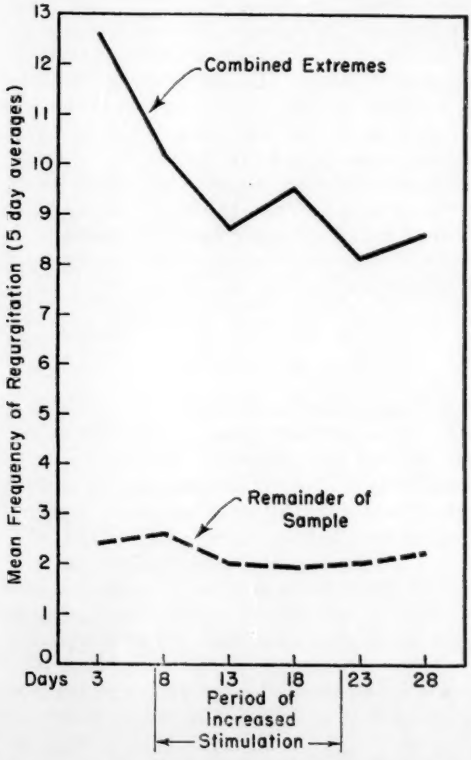

FIGURE 2—Frequency of regurgitation in the four extreme cases as compared with the remainder of the sample.

change of 5.8 regurgitations was significant at the 1 per cent level (t=2.85). An inspection of the data suggested to the authors that much of the drop in frequency was due to a reduction in the incidence of regurgitation in the extreme cases. To illustrate the contribution of the extreme cases to the decrease, the two most extreme ones during the first week of the period were determined for both groups; the five-day averages for this group of four subjects are compared in Figure 2 with the averages for the remainder of the sample. This figure suggests that the decrease in frequency during the period of the study was limited chiefly to the extreme cases.

The Effect of "Stimulus Feeding" upon the Frequency of Regurgitation

In order to determine if stimulation of the experimental group materially affected the incidence of regurgitation, the two groups were compared on the change in frequency from the first to the third week, the period of most rapid decrease. While the difference in change favored the experimental group, it was not significant (t = 1.44). An inspection of the data (cf. Figure 1) indicates that the insignificantly greater reduction in the experimental group is due to a chance concentration of extreme cases in this group and is probably to be interpreted in terms of the regression of these cases toward the mean. Thus, by chance, the assignment of cases to the experimental and control group biased the results in favor of the hypothesis. However, even thus biased, the results cannot be accepted as support for Ribble's hypothesis.

Summary and Conclusions

A number of writers have maintained that the infant's gastro-intestinal functions are easily disturbed as is shown, for example, in the frequency of regurgitation, and that the stimulation of the child by the mother over a prolonged period results in improved digestion. To test this hypothesis, 55 mothers whose infants showed some amount of regurgitation were requested to record the incidence of regurgitations and other reactions as they occurred. The subjects were randomly assigned to either a control or an experimental group. When the groups stabilized in terms of continuing participation, the subjects in the experimental group were paired with those in the control group on the basis of age. This procedure yielded 21 pairs.

The mothers in the experimental group were requested to increase the stimulation of their child for an additional 10 minutes prior to each feeding with the explanation that this was thought by some to speed language development. Following a two-week period of increased stimulation, the mothers were asked to return to their usual regime.

A comparison of the data thus obtained indicates that there is a decrease in regurgitation with age, but that the rate of decrease is not significantly affected by increased stimulation of the child. Some evidence suggests that the more extreme cases show the greatest decrease, as would be expected in terms of regression towards the mean. It should perhaps be pointed out that over a long period of time, in any group of normal infants, one would find a decrease in the incidence of regurgitation. If such a group of subjects received increased stimulation, it would appear, in the absence of a control group, that a causal relationship existed. In this connection it might be noted that it does not appear that Ribble's observations involved the use of a control group.

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HANDEDNESS AND RIGHT-LEFT DISCRIMINATION[1]

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Hand preference in manual activity has long been a topic of investigative interest because of its association with the language functions and the concept of cerebral dominance. Similarly, the ability to discriminate between the right and left sides of one's body has claimed attention, although to a lesser degree than is the case with handedness. Psychologists have utilized measures of right-left discrimination as an index of general intelligence and in the genetic study of children's conceptions of space. Neurologists have been particularly interested in the ability ever since the demonstrations by Bonhoeffer (4) and Gerstmann (6) that impairment in right-left discrimination is not only related to the presence of cerebral disease but also may possess localizing significance. While right-left disorientation in "pure" form (i.e., unaccompanied by more profound disturbances in the body schema) is rather uncommonly encountered in adult patients with cerebral disease, recent investigative work (1) suggests that it may occur in a clinically significant proportion of brain-injured and defective children.

The question arises as to whether there is a relationship between these two aspects of "laterality" or "right-left" behavior, the motor aspect being represented by degree of hand preference and the perceptual aspect reflected in the ability to discriminate between the right and left sides of one's body. Theoretical considerations might lead one to postulate such a relationship on the supposition that the perceptual discrimination develops

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out of, and is in part determined by, differential motor usage of the two hands. It would then be hypothesized that an individual who has a decided preference for the use of either hand will show a more developed perceptual capacity than one who does not have such a preference. This hypothesis was put to test in the present study.

METHOD

The *Ss* were 66 kindergarten and grade school children, ranging in age from 4 years, 11 months, to 8 years, 5 months, in MA (Kuhlmann-Anderson Tests or California Mental Maturity Test) from 4 years, 11 months, to 10 years, 9 months, and in IQ from 80 to 137. There were 32 boys and 34 girls in the group. Each *S* was examined individually. Hand preference was always investigated before right-left discrimination.

Handedness was assessed by a 35-item test battery which was a slight modification of that described by Johnson and Davis (7) and which sampled a variety of activities (writing, erasing, cutting, folding, turning a dial, using a screwdriver, pointing, etc.). For purposes of analysis, performance was scored in terms of the degree of deviation in either direction from a "right-hand" score of 17–18, which would represent an equal incidence of use of either hand. Thus, the use of the right hand on 30 or on 5 of the 35 tasks earned the same deviation score of 12, the two performances differing only in direction but not in degree of deviation from nonpreferential use of the hands. If *S* used both hands in the execution of the task, as occasionally happened, the item was not counted and the score pro-rated on the basis of a reduced total number of items.

Right-left discrimination was assessed by a 16-item battery which was a slight modification of that previously described by Swanson and Benton (8) and which sampled four aspects of the ability, viz.: (1) with eyes open, identification of body parts; (2) with eyes open, execution of "crossed commands," e.g., touching left eye with right hand; (3) with eyes closed, identification of body parts; (4) with eyes closed, execution of "crossed commands."[2] Performance was scored in terms of the number of consistent discriminations, disregarding the correctness of the responses with respect to the verbal symbols, "right" and "left," i.e., *S* would make a perfect score if he consistently showed the left body part when asked to show the right and vice versa and if he showed complete reversal in the execution of "crossed commands." Since interest was focused on the discriminative ability per se rather than on whether *S* had learned specific language habits, it was considered that this type of scoring was superior on logical grounds to a more conventional scoring in terms of absolute correctness of response.

[2] The modification of the original 20-item test battery consisted in the elimination of the four items dealing with identification of body parts on a front-view representation of a boy.

TABLE 1

FREQUENCY DISTRIBUTIONS OF HANDEDNESS, HANDEDNESS DEVIATION AND RIGHT-LEFT DISCRIMINATION SCORES

Score	*Handedness*	*Handedness Deviation*	*Right-Left Discrimination*
34–35	2		
32–33	6		
30–31	9		
28–29	9		
26–27	12		
24–25	10		
22–23	5		
20–21	1		
18–19	3		
16–17	2	3	24
14–15	1	6	19
12–13	..	9	3
10–11	1	12	9
8– 9	1	13	8
6– 7	3	11	3
4– 5	..	5	
2– 3	..	2	
0– 1	1	5	

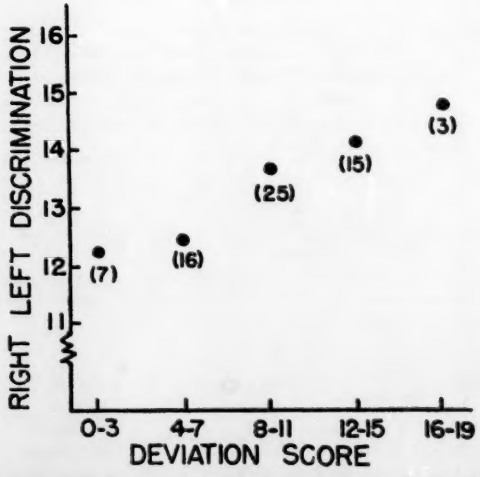

FIGURE 1—Mean right-left discrimination score as a function of handedness deviation score.

Results

Table 1 shows the distributions of the "right hand" and the deviation scores on the hand preference test and of the right-left discrimination test scores. It will be noted that, as would be expected, the distribution of hand preference scores is skewed in the direction of preference for use of the right hand. However, the distribution of deviation scores is essentially normal. On the other hand, the right-left discrimination scores show a non-normal distribution with a concentration of perfect scores reflecting the low ceiling of the test which was employed.

The relationship between handedness, as measured by the deviation scores, and right-left discrimination is shown graphically in Figure 1 which represents mean right-left discrimination score as a function of handedness deviation score. It will be noted that the relationship between these variables is positive and approximately linear.

The product-moment correlation coefficients between handedness and right-left discrimination, as well as those among other possibly pertinent factors, are presented in Table 2. Inspection of this table of correlation coefficients indicates that the relationship between degree of unilateral hand preference and right-left discrimination is of small magnitude and of questionable significance. Variations in chronological and mental age do not appear to have an important influence on the size of the relationship in this sample of *Ss*.

Table 2

PRODUCT-MOMENT CORRELATION COEFFICIENTS. VARIABLES: (1) HANDEDNESS DEVIATION SCORE, (2) RIGHT-LEFT DISCRIMINATION SCORE, (3) CHRONOLOGICAL AGE, (4) MENTAL AGE

Variables	*r*	*Variables*	*r*
12	.24*	13	.05
12.3	.24*	14	.19
12.4	.21*	23	.18
12.34	.22*	24	.19
		34	.74**

* $.05 < p < .10$ (two-tailed test).
** $p < .001$.

Discussion

The finding of a small positive association between degree of unilateral hand preference in motor activity and level of right-left discrimination can be interpreted as providing some support for the general hypothesis that these two aspects of "laterality" are related to one another. This conclusion

rests, of course, on the assumption that the observed correlation, while of small magnitude, is a significant one. However, even if this assumption is accepted, it is obvious that degree of unilateral motor preference can be only a minor determinant in the development of right-left discriminatory capacity in normal *Ss*. Variation in learning experience or other factors must be invoked as the major determinants of differences in this perceptual ability.

It is possible that in pathological *Ss*, such as brain-injured or defective children, a somewhat more impressive relation between the two variables would be observed. In analogous studies of the relation between right-left discrimination and finger-localization capacity, two behavioral skills that have been considered by clinical observers (2, 5) to show concomitant variation, such was found to be the case. In normal children these two functions showed a correlation coefficient of about .2, while in brain-injured and defective *Ss* of comparable mental age, the correlation was about .4 (1, 3). These findings raise the question whether in pathological *Ss* organic cerebral factors are not a more important determinant of the relationship between these two aspects of the "body schema" than is the case in normal *Ss*. This might also be true of the relationship between degree of hand preference and right-left discrimination. However, judging from the trend of previous results such as those cited with regard to right-left discrimination and finger localization, it seems likely that the correlation would be at best only moderate in size and account for only a small proportion of the total variance in the functions. In any event, the present findings suggest a considerable degree of specificity in the status of these behavioral skills that are often grouped together by the clinical observer under a single concept such as "laterality" or the "body schema."

Summary

Using young schoolchildren as *Ss*, a study of the association between right-left discrimination and degree of unilateral hand preference, as measured by the extent of deviation from equal use of either hand in manual activities, indicate that the two behavioral variables were related to a small and questionably significant degree. Variations in chronological and mental age did not affect the size of the relationship in this sample of *Ss*.

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SELF-CONCEPTIONS, MOTIVATIONS, AND INTERPERSONAL ATTITUDES OF LATE- AND EARLY-MATURING BOYS[1]

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While many intensive case studies show that personal and social adjustment during adolescence may be profoundly influenced by rate of physical maturation, there is a scarcity of systematic data on the relationship between the adolescent's physical status and his underlying motivations, self-conceptions and interpersonal attitudes. There is, however, a small body of evidence which demonstrates that greater physical maturity is associated with greater maturity of interest among girls (10) and that early-maturing boys differ from their late-maturing peers in both overt behavior and reputational status. In one study (8) in which a staff of trained observers assessed a large group of adolescents on a number of personality variables, boys who were consistently retarded in physical development were rated lower than those who were consistently accelerated, in physical attractiveness, grooming, and matter-of-factness; and higher in sociability, social initiative (often of a childish, attention-getting sort), and eagerness. Reputation Test (11) data indicated that classmates regarded the late-maturing boys as more attention-getting, more restless, more bossy, less grown-up and less good-looking than those who were physically accelerated.

On the basis of these findings, it may be inferred that adult and peer attitudes toward the adolescent, as well as their treatment and acceptance of him, are related to his physical status. This means that the socio-psychological environment to which late-maturers are subjected—and consequently the social learning situations they encounter—may be significantly different from that of their early-maturing peers. As a consequence, according to the ratings summarized above, they acquire different patterns of overt social behavior. It seems reasonable to hypothesize that groups

[1] The TAT data for this study were obtained by Harold E. Jones in connection with a test program at the Institute of Child Welfare.

differing in physical status will also differ in more covert aspects of behavior and personality.

Indirect evidence relevant to this hypothesis comes from an investigation of the long-term consequences of physical acceleration or retardation during adolescence. Jones (6) found that group differences in physique had practically disappeared by the time her early- and late-maturing subjects reached their early thirties. Nevertheless, young adults who had been physically retarded adolescents differed from those who had been accelerated in several important psychological characteristics. In general, it appeared that the adult subjects could be described much as they had been during adolescence. Thus, those who had been early-maturers scored higher on the good impression, socialization, dominance, self-control (low score on impulsivity), and responsibility scales of the California Personality Inventory, while those who had been slow in maturing scored higher on the flexibility scale. On the Edwards Personal Preference Schedule, early-maturers scored significantly higher on the dominance scale, while the late-maturing were high in succorance. Jones concludes that the early-maturing "present a consistently favorable personality picture with regard to . . . important social variables" (6). Moreover, there was some evidence that these men had attained more stable vocational adjustments than those who had been late in maturing. These group differences in later adjustment suggest that the sociopsychological atmosphere in which the adolescent lives may have profound immediate and enduring effects on his personality structure as well as on his overt behavior.

The present study was designed to investigate the relationship between maturational status and certain important, covert aspects of personality during late adolescence. Personality structure was assessed by means of the Thematic Apperception Test (TAT) which seems to be the most appropriate and sensitive instrument for this purpose. More specifically, on the basis of the literature reviewed above and other general works on the psychology of adolescence (1, 4, 5), we formulated and tested a series of propositions relating to differences between the physically retarded and the accelerated in self-conceptions, underlying motivations, and basic interpersonal attitudes. These variables were translated into TAT categories —needs (*n*), press (*p*), and descriptions (defined briefly in Table 1)— and the scores of early- and late-maturers in each of these categories were compared. The propositions and the rationale underlying them, together with the TAT variables involved, follow.

1. In view of their obvious physical retardation, relatively unfavorable reputations and disadvantageous competitive position in many activities, the late-maturing boys are more likely to have feelings of inadequacy. Hence, more boys in this group than in the early-maturing group are likely to have negative self-conceptions (TAT category: *negative characteristics*).

2. The adolescent in our culture generally desires some independence and adult status. This may be the source of a major problem for the

late-maturer, however, since he is often regarded and treated as a small boy by adults and peers and is not likely to be granted independence as early as physically accelerated boys. Therefore, it may be anticipated that more late- than early-maturers regard adults, particularly their parents, as dominating, forcing them to do things they don't want to or preventing them from doing things they want to do (high scores in *p Dominance*). Moreover, the parental treatment these boys experience and parental refusal to grant them independent status may be interpreted as personal rejection. Hence, we predicted that more late-maturing boys would score high in *p Rejection*.

3. These feelings of being dominated and rejected may result in attitudes of rebellion against the family and in feelings of hostility. We therefore expected that more of the late-maturing group would reveal strong aggressive needs (high scores in *n Aggression*) and desires to escape from (*n Autonomy—leaving parents*), or to defy, the family (*n Autonomy—defying parents*).

4. On the basis of the data indicating that slow-maturers showed a great deal of social interest (although often of an immature kind), we hypothesized that more members of this, than of the early-maturing group would reveal strong interests in friendly, intimate interpersonal relationships (high scores in *n Affiliation*).

5. Assuming that, as Jones and Bayley (8) suggest, the social initiative and attention-getting devices of the late-maturers are of a compensatory nature, we would expect this group to be basically dependent and to have strong needs for support from others. These should be manifest by higher scores in TAT *n Succorance* and *p Nurturance*. The latter may be considered a more indirect measure of dependence, a kind of wish-fulfilling view of the world as helpful and friendly.

6. The early-maturer, being regarded and treated as more adult, is more likely to become self-confident, and to acquire high status goals. For these reasons, we predicted that more of the physically accelerated would give evidence of high achievement goals (high scores in *n Achievement*) and concern with personal recognition (high scores in *n Recognition*).

7. Late-maturing boys in our culture probably face more problems of personal adjustment than do their early-maturing peers. As a result of this, they may become more aware of their problems, and, as the high degree of flexibility of young adults who had been retarded in maturing suggests, more insightful. Hence we predicted that they would be more willing and able than early-maturers to face their own feelings and emotions (low scores in the TAT variable *denial of feeling*).

In summary, we attempted to test seven propositions related to differences in the personalities of early- and late-maturing boys. It was hypothesized that more late-maturers would score high in variables relating to negative self-conceptions, dependence, aggression, affiliation, rebelliousness, and feelings of being dominated and rejected. More early-maturers, on

the other hand, were expected to reveal strong achievement and recognition needs, feelings of personal success, and tendencies toward denial of feelings.

Procedure

The 33 seventeen-year-old male subjects of this investigation were members of the Adolescent Growth Study which included a normal sample of boys in an urban public school system (3). The subjects of the present investigation represented two contrasting groups, selected on the basis of their physical maturity status: 16 of them had been among the most consistently accelerated throughout the adolescent period; the other 17 had been among the most consistently retarded.[2] All of them took the Thematic Apperception Test, which provides the basic data of this study, at age 17.

The TAT consisted of 18 pictures: nine from the Murray set which is now standard (cards 1, 5, 6, 7BM, 10, 11, 14, 15, 17); five pictures from the set generally used in 1938 when these data were collected (a man and woman seated on a park bench; a bearded old man writing in an open book; a thin, sullen, young man standing behind a well-dressed older man; a tea table and two chairs; an abstract drawing of two bearded men); and four designed especially for this investigation (the nave of a large church; a madonna and child; a dramatic view of mountains; a boy gazing at a cross which is wreathed in clouds).

The tests were administered individually. Each card was projected on a screen while the subject told a story which was recorded verbatim. Standard instructions were given for the Murray cards, and subjects were asked to describe the feelings elicited by the other four pictures. Most of the stories were brief, consisting of only one or two sentences.

As we noted earlier, each of the personality variables involved in the seven propositions was translated into a TAT scoring category. The scoring scheme involved counting the relevant needs, press, and descriptions of the heroes of the stories, the assumption being that the storyteller has identified with the hero: the hero's needs are the same as the boy's; the press that impinge upon the hero are the ones that affect the boy telling the story. A total of 20 needs, press, and descriptive categories, each defined as specifically as possible, was developed in the analysis of the protocols. A score for each subject for each TAT category was derived by counting the number of stories in which it appeared. A list of the categories used, together with brief descriptions of them, is found in Table 1.

[2] The present sample includes 27 of Jones and Bayley's (8) 32 subjects (the 16 most consistently retarded and 16 most consistently accelerated boys in the study). The other five boys had not taken the TAT at age 17. The six subjects who were in the present study but not in Jones and Bayley's study are the three "runners-up" from each end of the physical maturity distribution, i.e., the three who were closest to the 16 most accelerated cases and the three cases next to the 16 most retarded.

To test the reliability of this analysis, one of the authors (PM) and another psychologist[3] independently scored 15 complete protocols (300 stories). The percentage of interrater agreement was 90, computed by the usual formula (number of agreements divided by number of agreements plus number of disagreements).

In order to eliminate bias, the scoring used in the present study was done "blind," that is, independently of knowledge of the subject's maturational status.

Results

Frequency distributions of the scores of all subjects were made for all the TAT variables. Each distribution was then dichotomized at the point which most nearly enabled the placing of half of the 33 subjects above, and half of them below, the dividing point. Subjects having scores above this point were considered high in this particular variable; those with scores below this point were considered low in this variable. Chi square tests were used to test the seven propositions, i.e., to ascertain whether or not high scores in certain TAT variables were in fact more characteristic of one group (late- or early-maturers) than of the other.

Table 1 lists the TAT variables, the number of late- and early-maturers with high scores in the variable, the chi square value obtained and the level of significance. It should be noted that the hypotheses tested were one-sided hypotheses, while the chi square value is in terms of a two-sided hypothesis. When chi square has only one degree of freedom, the square root of chi square has a distribution which is the right hand half of a normal distribution. In order to test a one-sided hypothesis, the chi square test must be converted into the equivalent value in terms of a unit normal deviate (2). The levels of significance reported in Table 1 were evaluated in these terms.

Table 1 shows that, as had been predicted, more late-maturing than early-maturing boys revealed feelings of inadequacy and negative self-concepts, i.e., scored high in the TAT variable *negative characteristics*. Hence proposition 1 was confirmed. This finding is consistent with the frequently made clinical observation that retardation in physical maturation may be an important source of personal maladjustment and attitudes of inferiority.

Proposition 2 stated that more late-maturers regard their parents as highly dominating and rejecting. The evidence summarized in Table 1 substantially supported this proposition. While the difference was not statistically significant, more late- than early-maturers scored high in *p Dominance by parents* (total). There was a marked difference between the groups in the variable which involves parental domination by forcing

[3] We are indebted to Dr. Virginia B. Ware for her participation in this aspect of the study.

TABLE 1

NUMBER OF EARLY- AND LATE-MATURERS SCORING HIGH IN TAT VARIABLES

TAT Variable	*Definition of Variable*	*High Early-Maturers*	*High Late-Maturers*	*Chi Square Value*	*p*
Proposition 1					
Negative Characteristics ...	H is described in negative terms (e.g., imbecile, weakling, fanatic)	5	13	6.80	<.01
Proposition 2					
p Dominance 1 ..	H forced by parents to do something he doesn't want to	4	8	1.73	.09
p Dominance 2 ..	H prevented by parents from doing something he wants to	6	8	.31	>.30
p Dominance 3 ..	Total instances of H's being forced by parents to do something and/or prevented from doing something	7	11	1.46	.11
p Rejection	H rejected, scorned, or disapproved of by parents or authorities	5	11	3.69	.03
Proposition 3					
n Aggression 1 ..	H is aggressive in physical, asocial way	8	3	3.88	.02
n Aggression 2 ..	H is mad at someone, argues	7	4	1.52	.10
n Aggression 3 ..	Total of all H's aggressive actions	11	8	1.26	.10
n Autonomy 1 ..	H leaves home	7	10	.75	.20
n Autonomy 2 ..	H disobeys or defies parents	7	11	1.46	.11
n Autonomy 3 ..	Total of instances in which hero leaves and/or defies his parents	3	9	4.16	.02
Proposition 4					
n Affiliation 1 ...	H establishes good relations with his parents	8	8	.00	>.50
n Affiliation 2 ...	H falls in love, has a romance, marries	9	14	2.66	.05
n Affiliation 3 ...	Total instances in which H establishes and/or maintains friendly relations	8	12	1.46	.11
Proposition 5					
n Succorance	H feels helpless, seeks aid or sympathy	7	12	2.43	.06
p Nurturance 1 ..	H is helped, encouraged, or given something by parents	5	8	.93	.18
p Nurturance 2 ..	H is helped, encouraged, or given something by someone else (not parents)	8	14	3.88	.02
Proposition 6					
n Achievement ..	H attempts to attain a high goal or to do something creditable	9	10	.02	>.50
n Recognition ...	H seeks fame and/or high prestige status	9	8	.28	>.30
Proposition 7					
Denial of Feeling .	S states that picture elicits no thoughts or feelings	9	5	2.43	.06

the child to do something he does not want to do (*p Dominance by parents, forcing*). However, examination of the data with respect to the variable *p Dominance by parents* (*prevention*) makes it necessary to reject that part of the proposition which maintains that late-maturers are more likely to view their parents as highly restrictive of their activities.

That aspect of proposition 2 which deals with feelings of rejection was confirmed by our data. Compared with the early-maturing group, a significantly greater proportion of the late-maturers told stories in which the hero was rejected by parents or authority figures. These feelings of rejection may stem from different sources. In some cases, the parents' behavior may make it clear that they are disappointed in their physically retarded son whom they regard as immature. The boy, perceiving this attitude, may interpret it as rejection. In other cases, parental reluctance to allow the late-maturing boy to establish his independence may lead to considerable tension in the family and the boy's feelings of rejection may simply reflect the ongoing parent-child conflict.

It is possible that earlier in their teens, soon after the physical changes of adolescence became apparent, many of the early-maturing boys also experienced conflicts with their parents, arising from difficulties in establishing their independence or in handling emerging heterosexual interests. At that time they too may have felt dominated or rejected. However, by the age of 17, when these data were collected, these boys were ordinarily treated as adults and granted more freedom. Hence, they were more likely to have resolved many of their conflicts with their parents and to feel accepted and independent.

The hypothesis (part of proposition 3) that more late-maturers would be highly aggressive was rejected on the basis of the evidence given in Table 1. In fact, the differences between the two groups on all the TAT aggression variables were in the opposite direction from the prediction. High scores in the variables relating to aggression of the most overt and violent type were significantly more frequent among the early-maturers, and more members of this group also scored high in measures of milder (verbal) aggression and of total aggression. While late-maturers may experience more problems of adjustment and greater frustrations than their early-maturing peers, they apparently do not manifest greater aggressive motivation. It may be that their own feelings of inadequacy or fears of retaliation and punishment for aggression inhibit their expression of hostile feelings, even in fantasy. On the other hand, the early-maturers who feel more secure personally, and recognize their own relatively advantageous physical and social status, may feel freer to express their aggressive needs. Since aggression is a culturally stereotyped masculine trait, it seems possible that the physically accelerated, being accepted as mature and identifying readily with adult males, are more likely to acquire this characteristic. In any case, the finding that early-maturers express higher aggressive motivation during late adolescence seems consistent with Jones'

finding that, as young adults, they score high on the dominance scale of the Edwards Personal Preference test (6). Perhaps the relatively strong aggressive motivation of the early-maturer, or the mature sex-role identification it may imply, serves as a basis for the development of later qualities of leadership and persuasiveness (7).

As Table 1 indicates, the other aspect of proposition 3 was confirmed: a significantly greater proportion of late- than of early-maturers displayed strong motivations to escape from, or defy, their parents. These may be essentially aggressive reactions, stemming from feelings of parental domination and rejection, or they may reflect the late-maturers' awareness of their strife with their parents whom they perceive as blocking their drives for independence. These strong needs for escape and defiance may also be considered evidence of a generally immature way of handling parent-child conflicts. Perhaps, by the age of 17, the early-maturers have already resolved many of their conflicts with their families and/or have learned to handle these in less rebellious and in more direct and mature ways.

Proposition 4 stated that, compared with their early-maturing peers, more late-maturers would manifest strong needs for establishing close social contacts with others. While there was some confirmatory evidence, the results were not clear-cut. When all affiliative needs were considered together (score for *n Affiliation—total*), the group differences were in the predicted direction, but not statistically significant. Examination of the protocols revealed that almost all instances of affiliation concerned either parents or the opposite sex; there were very few stories involving close, friendly associations between like-sexed peers. The two major types of affiliation were scored separately. As Table 1 shows, late-maturers did not differ from early-maturers with respect to need for affiliation with parents, but a significantly greater proportion of the former group displayed strong motivation for heterosexual affiliation.

In view of the late-maturers' strong feelings of inadequacy and dependent needs (see below), it is surprising that a greater proportion of this group did not exhibit strong needs to establish and maintain close bonds with their parents. This may be due to the late-maturers' more intense conflicts with their parents at this age (17 years), their fears of being rejected and dominated by them, and their generally defiant attitudes which prevent them from admitting, even in fantasy, their strong underlying needs to form close contacts with them.

The significant difference between the groups in *n Affiliation* (*love, romance, marriage*) is subject to several possible interpretations. For one thing, this category may refer to general needs to establish close relations with others (with peers or adults other than parents) and not merely to desire for contact with the opposite sex. The set of stimulus cards may not have been adequate to elicit responses indicative of more general affiliative needs; hence, these were expressed through responses in the heterosexual affiliation category. If this is true, proposition 4 was confirmed,

and the late-maturers' high scores in this variable indicate their greater general interest in establishing and maintaining friendly relationships.

It is also possible that the late-maturers' strong affiliative needs are actually directed only toward members of the opposite sex, i.e., that *n Affiliation* (*love, romance, marriage*) measures specifically heterosexual interests. Assuming that this is true, there is another plausible explanation for the discovered difference. As we saw earlier, the late-maturer may be afraid to admit that he desires close associations with his parents. He may also feel that his immaturity and poor reputational status prevent him from establishing successful social relationships with like-sexed peers. Hence, he may "displace" his affiliative needs to members of the opposite sex, who, in his fantasies, may seem more responsive.

A third possible explanation of the difference is based on Jones and Bayley's findings that the late-maturers show less overt interest in girls and are regarded as less good-looking (8). From these data, it may be inferred that the physically retarded probably do not have successful and rewarding experiences with girls. Hence their heightened need for affiliation with the opposite sex, expressed in the TAT, may reflect their attempts to satisfy in fantasy needs which they cannot satisfy adequately in reality.

The data were generally supportive of proposition 5 which stated that late-maturers are likely to have strong underlying dependent needs. A higher proportion of this group than of their early-maturing peers scored high in *n Succorance*, the difference between the two groups approaching statistical significance ($p = .06$). Furthermore, high scores in the category involving receiving help and support from others (not including parents) (*p Nurturance—non-parents*)—an indirect measure of dependent needs—were significantly more characteristic of the physically retarded than of the physically accelerated. In view of the late-maturers' attitudes toward their parents, discussed above, it is not surprising to find that perceptions of parents as kindly and supportive (high scores in *p Nurturance-parents*) were not significantly more common in this group than in the early-maturing group.

On the basis of the data involving the TAT variables *n Achievement* and *n Recognition*, we rejected proposition 6 which stated that more early-maturers would be self-confident and have high needs for achievement and personal recognition. In our culture there is strong pressure to develop needs for achievement and personal recognition, and, according to our results, these needs and feelings may become intense regardless of—or perhaps in spite of—the child's maturational status, feelings of personal adequacy, dependency, and adjustment to parents.

Two interesting incidental findings from the TAT data seem to be consistent with the proposition that more early- than late-maturers are likely to be self-confident. Seven boys in this sample of 33 adolescents told stories in which the hero was helpful or kind to someone else (*n Nurturance*). Of this group, six were early-maturers, while only one was a late maturer

($\chi^2 = 2.09$, $p = .07$). Insofar as *n Nurturance* may be a measure of the storyteller's own feelings that he can accept an active, mature role, more of the accelerated group feel self-assured with respect to having attained mature status.

The other incidental finding which seems to support proposition 6 is based on responses only to card 1 of the Murray series which depicts a young boy contemplating a violin which rests on a table in front of him. Eight of the subjects spoke of the boy (the hero) as a prodigy or a genius. Of these, seven were early-maturers; only one was physically retarded ($\chi^2 = 5.25$, $p = .01$). If the attribution of this prestige status and accomplishment to the hero reflects the subject's own feeling that he has been an achiever, it follows that more of the physically accelerated have positive self-concepts. In view of the small number of cases involved, both of these findings must be considered tentative, but they do offer some evidence in support of proposition 6.

Proposition 7, which stated that relatively few of the physically retarded boys are unwilling or unable to face their own feelings and emotions, received some support from the TAT data summarized in Table 1. A smaller proportion of the members of this group than of the physically accelerated group specifically denied that the pictures evoked any feelings or emotions (e.g. "It doesn't make me think of anything"). While this variable may not adequately measure *denial of feeling* as a major defense mechanism, this result seems to indicate that late-maturers are more sensitive to their own feelings and more ready to admit and face them openly. Since these qualities are basic to the development of psychological insight, it may be inferred that late-maturers, as a group, are more likely to become insightful individuals.

Discussion

The results of the study support the general hypothesis that, in our culture, the boy whose physical development is retarded is exposed to a sociopsychological environment which may have adverse effects on his personality development. Apparently, being in a disadvantageous competitive position in athletic activities, as well as being regarded and treated as immature by others, may lead to negative self-conceptions, heightened feelings of rejection by others, prolonged dependent needs, and rebellious attitudes toward parents. Hence, the physically retarded boy is more likely than his early-maturing peer to be personally and socially maladjusted during late adolescence. Moreover, some of his attitudes are likely to interfere with the process of identification with his parents, which is generally based on perceptions of them as warm and accepting (9). This, in turn, may inhibit or delay the acquisition of mature characteristics and attitudes which are ordinarily established through identification with parents. Fortunately for the late-maturers'

subsequent adjustments, they seem more willing and able to face their feelings and emotions. This may be a result of their awareness of others' attitudes toward their immaturity or their feelings of personal inadequacy and dependency.

The physically accelerated boys, on the other hand, are likely to experience environmental circumstances which are much more conducive to good psychological adjustment. Hence, their psychological picture, as reflected in their TAT stories, is much more favorable. By the time they were 17, relatively few early-maturers habored strong feelings of inadequacy, perceived themselves as rejected or dominated by parents or authorities, or felt rebellious toward their families. As a group, they appeared to have acquired more self-confidence and had probably made stronger identifications with mature adults. Hence, they perceived themselves as more mature individuals, less dependent and in need of help, and more capable of playing an adult male role in interpersonal relationships.

These findings assume additional, probably greater, importance when they are considered in the light of Jones' findings on the early adult (age 33) adjustments of boys who had been retarded or accelerated in physical maturing (6). It should be recalled that by this age physical differences between the two groups had practically disappeared. Certain important psychological differences were noted, however, and these were consistent with the differences at age 17, reported in the present study. For example, the responses of the early-maturing group to two paper-and-pencil tests revealed that, as young adults, they were more dominant, more able to make a good impression and more likely to be turned to for advice and reassurance; more self-controlled; and more willing and able to carry social responsibility. In short, they present a general picture of psychological maturity. Moreover, more of the early-maturers seemed to have made successful vocational adjustments. In contrast to this, when the late-maturers became adults, they tended to be highly dependent individuals who could be described, on the basis of their test responses, as tending to be rebellious, touchy, impulsive, self-indulgent, and insightful. Most of these characteristics are indicative of poor adjustment and psychological immaturity. Fewer members of this group had made good vocational adjustments.

The striking correspondence between the two descriptions of the groups, derived from different kinds of tests and collected at widely separated periods of time, lends further support to Jones' conclusion that "the adolescent handicaps and advantages associated with late- or early-maturing appear to carry over into adulthood to some extent" (6). It seems clear that many attributes of adolescent personality (patterns of motivation, self-conceptions, and attitudes toward others) characteristic of late- and early-maturing boys are relatively stable and durable rather than situational and transitory. This may be attributable to the fact that

in our culture adolescence is generally a critical and difficult period of adjustment. Within a relatively brief interval of time, the child must work out numerous complex and vitally important personal problems—e.g., adaptation to his changed biological and social status, establishment of independence, vocational adjustment. In dealing with these problems, he may acquire new behaviors and personality attributes which have broad ramifications, not only on his current adjustment, but also on his subsequent development. If the adolescent can cope with his problems without too much inner stress and turmoil, his self-esteem, feelings of adequacy, and consequently his subsequent adjustment, are likely to be enhanced. On the other hand, if his problems induce great tension and anxiety, he is likely to feel frustrated and inadequate, and, if these feelings are maintained, to adjust less satisfactorily as an adult.

Obviously, the adolescent's success or failure, as well as ease or tension, in handling his problems will be determined to a large degree by the sociopsychological forces to which he is subjected during this time, and these, as we have seen, may be significantly related to his rate of maturation. Thus, physical status during adolescence—mediated through the sociopsychological environment—may exert profound and lasting influences on personality. For this reason, many aspects of the adult's behavior and personality seem consistent with his adolescent adjustments, attitudes and motivations.

Insofar as our results permit generalization, they suggest that some important aspects of motivation, such as needs for achievement and personal recognition, are not significantly affected by maturational status. It may be that among subjects whose achievements are strongly encouraged and rewarded from very early childhood, the need to achieve becomes powerful and resistant to change even in the face of feelings of helplessness and inadequacy. The latter may inhibit the achievement-oriented overt behavior of some late-maturers, but the underlying motivation to achieve seems as strong in this group as it is among the physically accelerated.

In conclusion, it should be noted that, although rate of maturing and associated factors may affect personality development, the relationship between physical status and psychological characteristics is by no means simple. A vast number of complex, interacting factors, including rate of maturation, determine each adolescent's unique personality structure. Hence, in any specific instance, the *group* findings of the present study may not be directly applicable, for other physical, psychological, or social factors may attenuate the effects of late- or early-maturing. For example, an adolescent boy who is fundamentally secure and has warm, accepting parents and generally rewarding social relationships may not develop strong feelings of inadequacy even if he matures slowly. Analogously, the early-maturing boy who has deep feelings of insecurity, for whatever reasons, will probably not gain self-confidence simply because he matures early. In summary, in understanding any individual case, generalizations

based on the data of the present study must be particularized in the light of the individual's past history and present circumstances.

Summary

The present investigation was designed to test seven propositions concerning the relationship between rate of physical maturation and important aspects of personality structure, specifically, self-conceptions, underlying motivations, and basic interpersonal attitudes. The TAT protocols of 33 seventeen-year-old boys—16 who had been consistently physically accelerated throughout adolescence and 17 who had been consistently retarded—were analyzed according to a scoring schema involving 20 needs, press, and descriptive categories. The scores of early- and late-maturers in each of the categories were compared.

An earlier study (8) demonstrated that late-maturing boys are more likely than their early-maturing peers to encounter a generally unfavorable sociopsychological environment. Analysis of the data of the present study indicates that this situation may have adverse effects on the personalities of the physically retarded. These boys are more likely to have negative self-conceptions, feelings of inadequacy, strong feelings of being rejected and dominated, prolonged dependency needs, and rebellious attitudes toward parents. In contrast, the early-maturing boys present a much more favorable psychological picture during adolescence. Relatively few of them felt inadequate, rejected, dominated, or rebellious toward their families. More of them appeared to be self-confident, independent, and capable of playing an adult role in interpersonal relationships. Early- and late-maturing groups did not differ significantly from each other in needs for achievement or personal recognition.

These findings make it clear that rate of physical maturing may affect personality development in crucially important ways. However, it is important to note that in any particular case the effects of early- or late-maturing may be significantly modified by the individual's psychological history and present circumstances.

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